AUTOMATIC TRANSMISSION 17A

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GENERAL DESCRIPTION

Effective January 1977 2,0 litre engine Transit vehicles are available with C3 automatic transmission as an optional extra.

Apart from minor modifications this transmission will be similar to the C3 transmission assembly already fitted to passenger cars, Fig. 1.

The selector lever is located in an instrument panel gear shift gate, with the drive positions required being selected by appropriate lever operation.

Position sequence and symbols are shown on the selector escutcheon.

In the event of impact the selector lever will engage in the gear shift gate. It may subsequently be withdrawn again and a clearly audible clicking noise will indicate proper lever engagement (in the absence of such noise it may be necessary for the lever to be moved slightly to the right or left).

For identification of transmission provision is made for a metal tag on extension housing.

Transmission Identification Tag

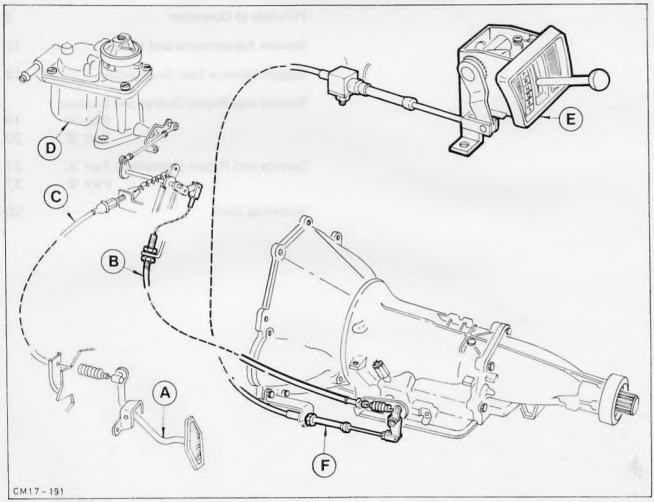

Fig. 1. Automatic transmission operating system

A – Accelerator pedal
B – Downshift cable
C – Throttle cable
D – Carburettor
E – Gear shift gate
F – Selector cable

GENERAL DESCRIPTION (cont'd)

This automatic three-speed transmission has three forward speed selection ranges D, 2 and 1 and in addition it has the selector positions P, R and N. A starter inhibitor prevents the engine being started up with a gear selected. **The engine can be started only in the N (Neutral) and P (Park) position.**

When the engine has warmed up to its working temperature the creep of the car is slight, **but even then the footbrake must be applied before the selector lever is moved from the P or N position to start driving.**

When the position 'D' is selected, automatic gear changes upwards and downwards occur in relation to the speed of the vehicle and, in addition, kickdown is possible. Kickdown occurs when the accelerator pedal is fully pushed down against the bottom stop.

P = Park. In this position the output shaft is locked by a parking pawl which engages in the parking gear wheel. The selector lever must never be moved into the P position unless the **car is stationary.**

R = Reverse. The R position may be selected when the car is stationary.

Never position the selector lever in R (reverse) when the vehicle is still moving forwards.

Never position the selector lever in D, 2 or 1 when the vehicle is still moving backwards.

N = Neutral. When the selector lever is in neutral, no gear changing operations take place.

NOTE: Because of the carburettor's automatic choke, engines have a very much increased idling speed when they are cold and for several minutes after they have been started. This makes the vehicle move off immediately the selector lever is moved to position R, D, 2 or 1, so that in this case it is necessary to apply the hand or footbrake.

Selector lever in position D. In this position the vehicle will start off in 1st gear and will automatically change up from 1st to 2nd gear and from 2nd to top gear as the speed of the vehicle increases. Changing down to the appropriate lower gear also occurs automatically as the vehicle speed decreases. Only in this position can kickdown from top to 2nd and down to 1st gear occur.

Selector lever position 2. In this position the vehicle will start off in 2nd gear and remain in 2nd gear. It is advisable to select the position '2' for **gentle downhill slopes** or successions of 'S' bends (winding road). The continuously engaged 2nd gear with its engine braking effect, cuts down the work of the footbrake and improves road holding.

NOTE: Select the position '2' only when the vehicle speed is less than 80 km/h (50 mph). At speeds of more than 80 km/h (50 mph) position 'D' should be selected.

Selector lever position 1. In this position the car will start off in 1st gear and remain in 1st gear. To protect the brakes it is advisable to select '1' for **steep downhill slopes** so as to obtain the 1st gear engine braking effect. If this is done while travelling in top gear, the automatic transmission immediately changes down to 2nd gear and the engine braking action becomes noticeable.

If the selector lever is left in position '1', the transmission changes down automatically from 2nd gear to 1st gear when the vehicle speed has dropped to about 50 to 20 km/h (30 to 12 mph). The transmission then remains in 1st gear when the speed is increased again. Automatic gear shifting occurs only when the selector lever is moved back from position '1' to position 'D'.

NOTE: **The selector lever must not be moved into position '1' while the vehicle is travelling at over 80 km/h 50 (mph).**

Kickdown. This can take place in any driving situation where downward gear changes are advisable, e.g. in hilly areas or to accelerate to overtake. Kickdown from top to 2nd gear and from 2nd to 1st gear can be effected only when the selector lever is in the 'D' position.

Vehicle Towing

If a vehicle with automatic transmission has to be towed, put the selector lever in the 'N' position. If the distance to the destination does not exceed 20 km (12 miles), the vehicle may be towed at a speed of about 30 to 40 km/h (19 to 25 mph).

Before towing for distances exceeding 20 km (12 miles), remove the driveshaft or lift the rear axle of the vehicle.

Safety Tip

Before any carburettor checks are carried out with the engine running on a vehicle with automatic transmission, **it is essential to first move the selector lever to the 'P' or 'N' position and apply the handbrake hard.**

NOTE: When 'P' or 'N' is selected, on no account allow the engine to turn at more than 4500 rev/min as this will result in damage to the gearbox.

C2 Transmission – cutaway view

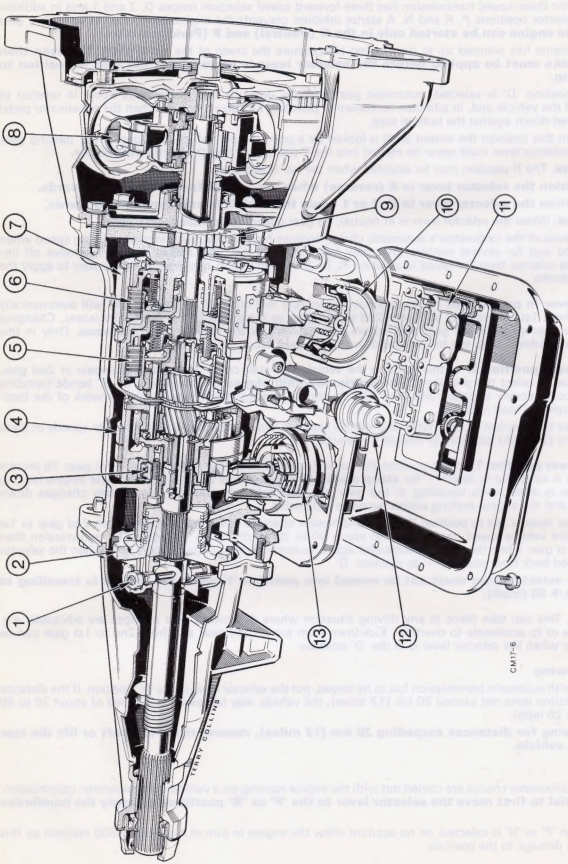

Fig. 2.
1. Governor assembly
2. Governor hub
3. Overrun clutch
4. Rear brake band
5. Forward clutch
6. Reverse and high gear clutch
7. Front brake band
8. Torque converter
9. Hydraulic pump
10. Front servo
11. Valve body
12. Vacuum diaphragm
13. Rear servo

PRINCIPLE OF OPERATION

HYDRAULIC SYSTEM – SELECTOR POSITION 'P' OR 'N'

Legend

Red = Main pipe pressure

Red/black = Torque converter pressure

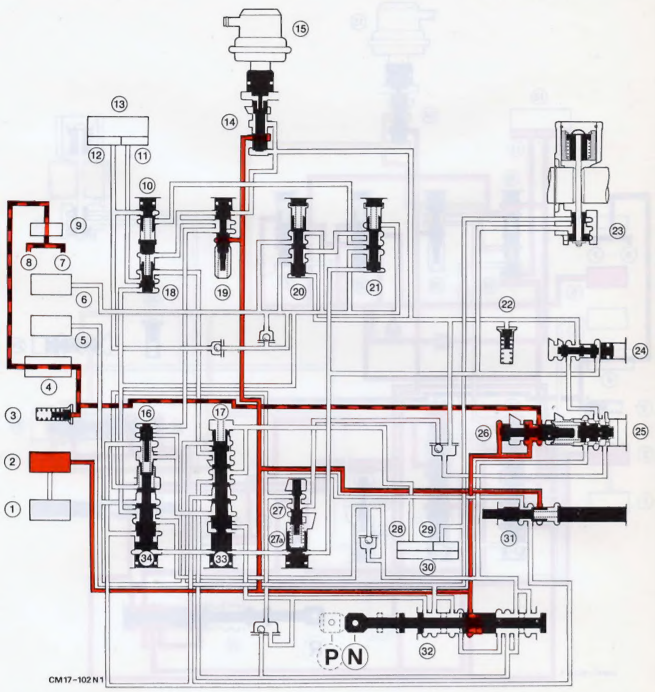

Fig. 3.

1. Oil filter
2. Hydraulic pump
3. Torque converter pressure relief valve
4. Torque converter
5. Forward clutch
6. Reverse and direct gear clutch
7. Rear lubrication
8. Front lubrication
9. Oil cooler and return valve
10. Band release delay valve
11. Load side, front servo
12. Discharge side, front servo
13. Front servo
14. Pressure throttle valve
15. Vacuum diaphragm
16. Pressure balancing throttle valve
17. 2nd gear valve
18. Servo regulator valve (2nd/3rd gear)
19. Pressure boost throttle valve
20. Switching control valve (3rd/2nd gear)
21. Modulator valve
22. Pressure relief throttle valve
23. Mechanical governor
24. Main pipe pressure reduction valve
25. Main pipe boost valve
25. Main pipe regulator valve
27. Pressure boost valve (1st/2nd lever position)

27a. Pressure boost valve (1st/2nd lever position)

28. Load side, rear servo
29. Discharge, rear servo
30. Rear servo
31. Kickdown valve
32. Manual selector slide valve
33. Switching valve (1st/2nd gear)
34. Switching valve (2nd/3rd gear)

HYDRAULIC SYSTEM – SELECTOR LEVER POSITION 'R'

Legend

Red = Main pipe pressure
Red/black = Torque converter pressure
Yellow = Throttle pressure

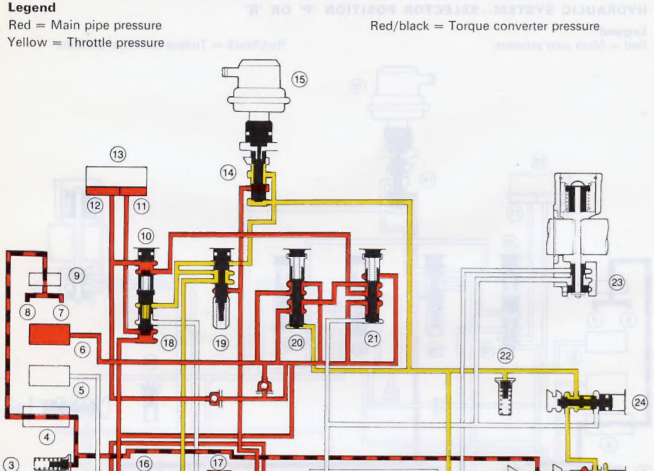

Fig. 4.

1. Oil filter
2. Hydraulic pump
3. Torque converter pressure relief valve
4. Torque converter
5. Forward clutch
6. Reverse and direct gear clutch
7. Rear lubrication
8. Front lubrication
9. Oil cooler and return valve
10. Band release delay valve
11. Load side, front servo
12. Discharge side, front servo
13. Front servo
14. Pressure throttle valve
15. Vacuum diaphragm
16. Pressure balancing throttle valve
17. 2nd gear valve
18. Servo regulator valve (2nd/3rd gear)
19. Pressure boost throttle valve
20. Switching control valve (3rd/2nd gear)
21. Modulator valve
22. Pressure relief throttle valve
23. Mechanical governor
24. Main pipe pressure reduction valve
25. Main pipe boost valve
26. Main pipe regulator valve
27. Pressure boost valve (1st/2nd lever position)
27a. Pressure boost valve (1st/2nd lever position)
28. Load side, rear servo
29. Discharge, rear servo
30. Rear servo
31. Kickdown valve
32. Manual selector slide valve
33. Switching valve (1st/2nd gear)
34. Switching valve (2nd/3rd gear)

HYDRAULIC SYSTEM – SELECTOR LEVER POSITION 'D-1'

Legend

Red = Main pipe pressure
Blue = Governor pressure
Yellow = Throttle pressure
Red/black = Torque converter pressure
Yellow/black = Reduced throttle pressure

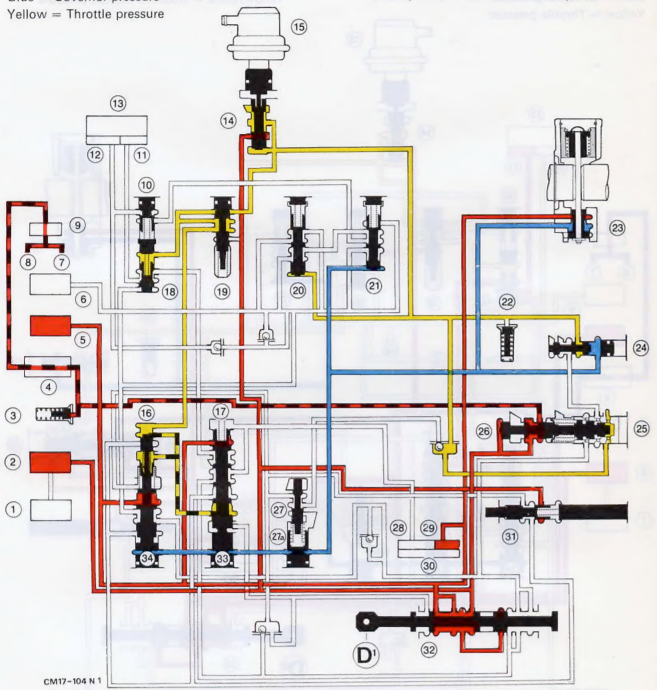

Fig. 5.

1. Oil filter
2. Hydraulic pump
3. Torque converter pressure relief valve
4. Torque converter
5. Forward clutch
6. Reverse and direct gear clutch
7. Rear lubrication
8. Front lubrication
9. Oil cooler and return valve
10. Band release delay valve
11. Load side, front servo
12. Discharge side, front servo
13. Front servo
14. Pressure throttle valve
15. Vacuum diaphragm
16. Pressure balancing throttle valve
17. 2nd gear valve
18. Servo regulator valve (2nd/3rd gear)
19. Pressure boost throttle valve
20. Switching control valve (3rd/2nd gear)
21. Modulator valve
22. Pressure relief throttle valve
23. Mechanical governor
24. Main pipe pressure reduction valve
25. Main pipe boost valve
26. Main pipe regulator valve
27. Pressure boost valve (1st/2nd lever position)
27a. Pressure boost valve (1st/2nd lever position)
28. Load side, rear servo
29. Discharge, rear servo
30. Rear servo
31. Kickdown valve
32. Manual selector slide valve
33. Switching valve (1st/2nd gear)
34. Switching valve (2nd/3rd gear)

HYDRAULIC SYSTEM – SELECTOR LEVER POSITION 'D-2'

Legend

Red = Main pipe pressure
Blue = Governor pressure
Yellow = Throttle pressure
Red/black = Torque converter pressure
Yellow/black = Reduced throttle pressure

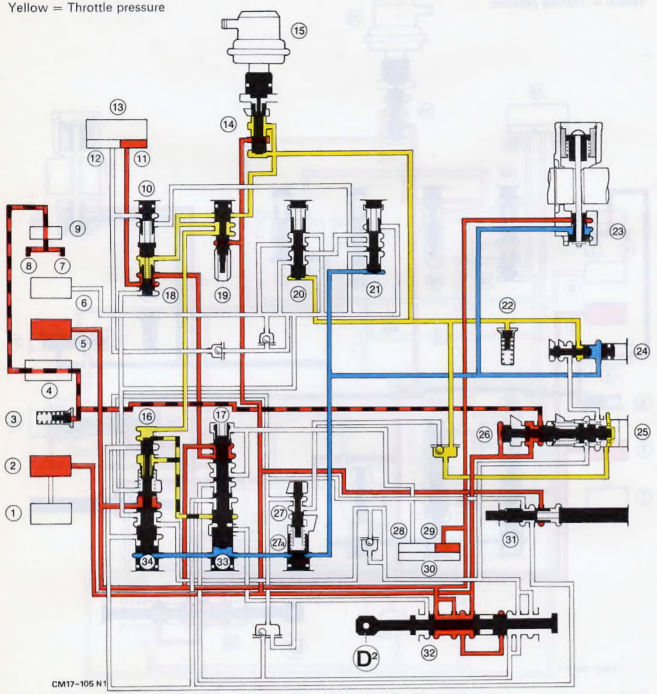

Fig. 6.

1. Oil filter
2. Hydraulic pump
3. Torque converter pressure relief valve
4. Torque converter
5. Forward clutch
6. Reverse and direct gear clutch
7. Rear lubrication
8. Front lubrication
9. Oil cooler and return valve
10. Band release delay valve
11. Load side, front servo
12. Discharge side, front servo
13. Front servo
14. Pressure throttle valve
15. Vacuum diaphragm
16. Pressure balancing throttle valve
17. 2nd gear valve
18. Servo regulator valve (2nd/3rd gear)
19. Pressure boost throttle valve
20. Switching control valve (3rd/2nd gear)
21. Modulator valve
22. Pressure relief throttle valve
23. Mechanical governor
24. Main pipe pressure reduction valve
25. Main pipe boost valve
26. Main pipe regulator valve
27. Pressure boost valve (1st/2nd lever position)
27a. Pressure boost valve (1st/2nd lever position)
28. Load side, rear servo
29. Discharge, rear servo
30. Rear servo
31. Kickdown valve
32. Manual selector slide valve
33. Switching valve (1st/2nd gear)
34. Switching valve (2nd/3rd gear)

HYDRAULIC SYSTEM – SELECTOR LEVER POSITION 'D-3'

Legend

Red = Main pipe pressure
Blue = Governor pressure
Yellow – Throttle pressure
Red/black = Torque converter pressure
Yellow/red = Boosted throttle pressure

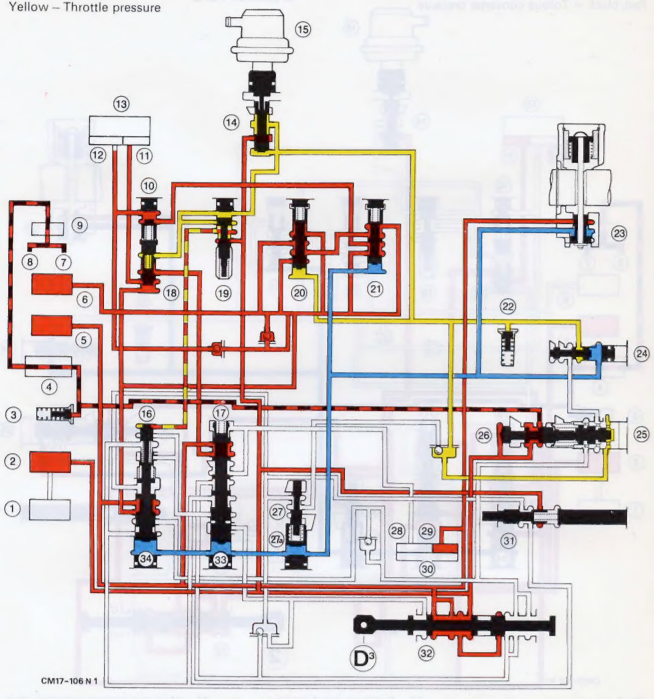

Fig. 7.

1. Oil filter
2. Hydraulic pump
3. Torque converter pressure relief valve
4. Torque converter
5. Forward clutch
6. Reverse and direct gear clutch
7. Rear lubrication
8. Front lubrication
9. Oil cooler and return valve
10. Band release delay valve
11. Load side, front servo
12. Discharge side, front servo
13. Front servo
14. Pressure throttle valve
15. Vacuum diaphragm
16. Pressure balancing throttle valve
17. 2nd gear valve
18. Servo regulator valve (2nd/3rd gear)
19. Pressure boost throttle valve
20. Switching control valve (3rd/2nd gear)
21. Modulator valve
22. Pressure relief throttle valve
23. Mechanical governor
24. Main pipe pressure reduction valve
25. Main pipe boost valve
26. Main pipe regulator valve
27. Pressure boost valve (1st/2nd lever position)
27a. Pressure boost valve (1st/2nd lever position)
28. Load side, rear servo
29. Discharge, rear servo
30. Rear servo
31. Kickdown valve
32. Manual selector slide valve
33. Switching valve (1st/2nd gear)
34. Switching valve (2nd/3rd gear)

HYDRAULIC SYSTEM – SELECTOR LEVER POSITION '2'

Legend

Red = Main pipe pressure
Blue = Governor pressure
Red/black = Torque converter pressure
Blue/red = Pressure to boost the main pipe pressure (rear wheels driving engine), with selector lever in position 1 or 2

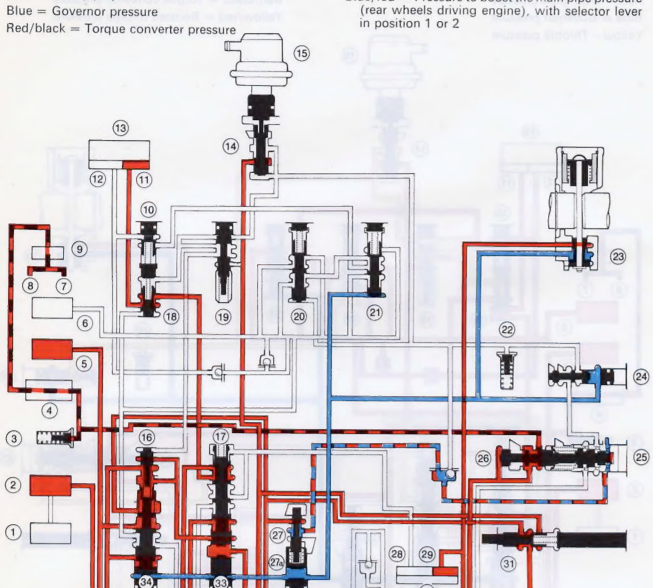

Fig. 8

1. Oil filter
2. Hydraulic pump
3. Torque converter pressure relief valve
4. Torque converter
5. Forward clutch
6. Reverse and direct gear clutch
7. Rear lubrication
8. Front lubrication
9. Oil cooler and return valve
10. Band release delay valve
11. Load side, front servo
12. Discharge side, front servo
13. Front servo
14. Pressure throttle valve
15. Vacuum diaphragm
16. Pressure balancing throttle valve
17. 2nd gear valve
18. Servo regulator valve (2nd/3rd gear)
19. Pressure boost throttle valve
20. Switching control valve (3rd/2nd gear)
21. Modulator valve
22. Pressure relief throttle valve
23. Mechanical governor
24. Main pipe pressure reduction valve
25. Main pipe boost valve
26. Main pipe regulator valve
27. Pressure boost valve (1st/2nd lever position)
27a. Pressure boost valve (1st/2nd lever position)
28. Load side, rear servo
29. Discharge, rear servo
30. Rear servo
31. Kickdown valve
32. Manual selector slide valve
33. Switching valve (1st/2nd gear)
34. Switching valve (2nd/3rd gear)

HYDRAULIC SYSTEM – SELECTOR LEVER POSITION '1'

Legend

Red = Main pipe pressure
Blue = Governor pressure
Yellow = Throttle pressure
Red/black = Torque converter pressure

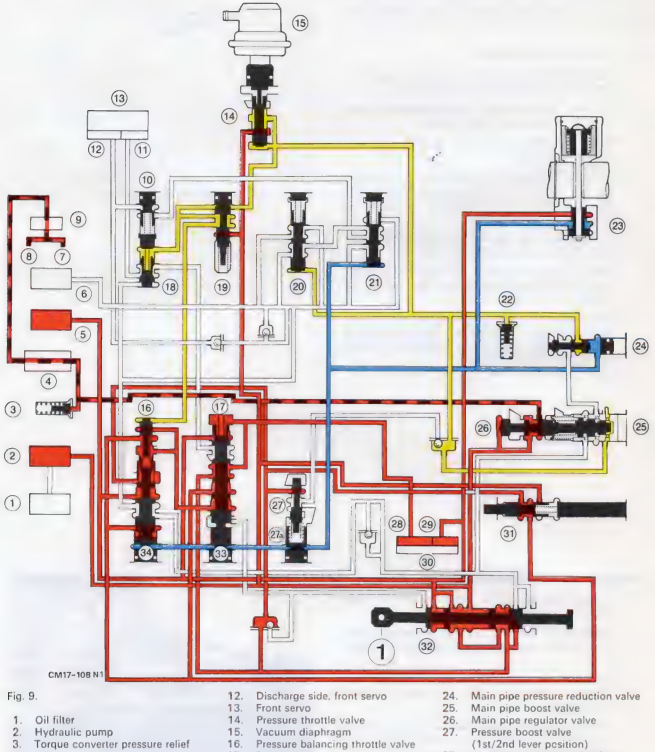

Fig. 9.

1. Oil filter
2. Hydraulic pump
3. Torque converter pressure relief valve
4. Torque converter
5. Forward clutch
6. Reverse and direct gear clutch
7. Rear lubrication
8. Front lubrication
9. Oil cooler and return valve
10. Band release delay valve
11. Load side, front servo
12. Discharge side, front servo
13. Front servo
14. Pressure throttle valve
15. Vacuum diaphragm
16. Pressure balancing throttle valve
17. 2nd gear valve
18. Servo regulator valve (2nd/3rd gear)
19. Pressure boost throttle valve
20. Switching control valve (3rd/2nd gear)
21. Modulator valve
22. Pressure relief throttle valve
23. Mechanical governor
24. Main pipe pressure reduction valve
25. Main pipe boost valve
26. Main pipe regulator valve
27. Pressure boost valve (1st/2nd lever position)
27a. Pressure boost valve (1st/2nd lever position)
28. Load side, rear servo
29. Discharge, rear servo
30. Rear servo
31. Kickdown valve
32. Manual selector slide valve
33. Switching valve (1st/2nd gear)
34. Switching valve (2nd/3rd gear)

SERVICE ADJUSTMENTS AND CHECKS

Fluid level check

An accurate fluid level check is best carried out directly after a short run when the transmission fluid has reached its operating temperature (65 °C) (150 °F).

Carry out the check as follows:

1. Position the vehicle on level ground, apply the handbrake and depress the brake pedal.
2. With the engine idling, move the selector lever through all positions three times.
3. Move the selector lever to position 'P' and wait for 1 minute.
4. With the engine idling withdraw the dipstick, Fig. 10, wipe it with a clean rag, replace and withdraw again. The fluid level should be at 'Max'.
5. If necessary, top up with the specified transmission fluid through the dipstick tube.

   NOTE: If the fluid level is below the 'min.' mark check transmission and oil cooler for leaks.

   Dark brown or black transmission oil is indicative of worn clutches or brake bands: if necessary, the transmission assembly should be dismantled and cleaned.

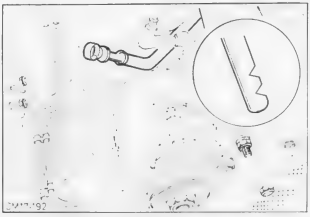

Fig. 10. Automatic gearbox fluid level check

To adjust the front brake band

1. Unhook the downshift cable from the transmission downshift lever.
2. Slacken the lock nut on the adjusting screw and slacken the adjusting screw by a few turns.
3. Screw in the adjusting screw using the Tool 17–005, Fig. 11, until the torque wrench disengages.
4. Slacken the **adjusting screw by 1½ turns** and secure it with the lock nut, holding the adjusting screw still while doing so
5. Connect the downshift cable to transmission downshift lever.

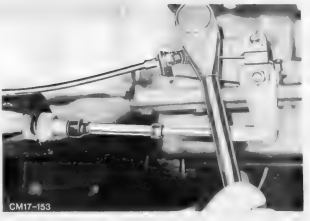

Fig. 11. Brake band adjustment

Check main line pressure (Oil pressure test)

1. Connect oil pressure gauge to transmission housing measuring connection, Fig. 12.

2. Position gauge in vehicle in such a manner that it can be easily read from the driver's seat.

3. Run the engine until transmission operating temperature is reached.

4. Check oil pressure at idling speed:

	MN/m²	kgf/cm²	lbf/in²
Selector position:			
R	0,60–0,90	(6,0–9,0)	(86–128)
P-N	0,34–0,50	(3,4–5,0)	(49–71)
D-2-1	0,40–0,60	(4,0–6,0)	(57–85)

Low oil pressure at idling speed:
(a) check oil level.
(b) check valve body.
(c) check torque converter and pump gears, if necessary dismantle and clean transmission assembly.

High oil pressure at idling speed:
(a) check engine idling speed.
(b) check vacuum connections on engine, vacuum line and connector as well as throttle valve.
(c) check valve body.

5. Check oil pressure at stall speed:

	MN/m²	kgf/cm²	lbf/in²
Selector position:			
R	1,67–1,90	(16,7–19,0)	(238–270)
D	1,00–1,14	(10,0–11,4)	(143–162)

Low oil pressure at stall speed:
(a) check vacuum line and throttle valve.
(b) check valve body.
(c) check forward clutch and/or reverse and top gear clutch and rear servo.

High oil pressure at stall speed:
(a) check valve body assembly.

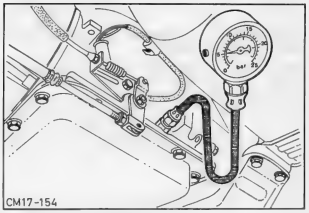

Fig. 12. Check oil pressure

SERVICE ADJUSTMENTS AND CHECKS (cont'd)

TORQUE CONVERTER – TEST AND CLEAN

Test for contact between the turbine wheel stator and the pump case

Mount the torque converter on the hydraulic pump hollow shaft and rotate converter, Fig. 13. There must be no sounds of metallic contact.

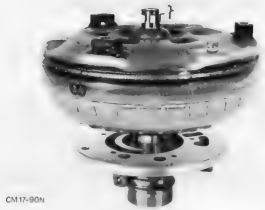

Fig. 13. Check the contact between turbine wheel stator and pump case

Test for contact between the stator and the turbine

Turn the converter round. Push through the input shaft and rotate, Fig. 14. There must be no sounds of metallic contact.

Fig. 14. Check for contact between stator and turbine

Examine the torque converter hub for scoring or wear in the hydraulic pump oil seal area, Fig. 15.

Check the three torque converter mounting bosses for proper attachment and cracks at the welds, Fig. 15.

To clean the torque converter

Drain the converter, and flush thoroughly with about 1 litre (1,75 pints) of clean paraffin through the hollow hub. If metal particles are found, the torque converter should be renewed complete, since it is not possible to clean it satisfactorily.

Torque converter identification

Dwing to dependence on engine type the converter is identified by 2 letters (after part number) on front face. See Fig. 15 (right-hand part of illustration).

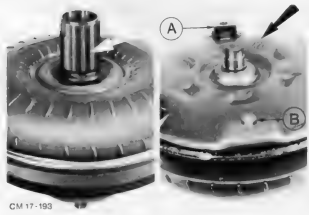

Fig. 15. Check the converter hub for scoring or wear
A – Mounting bosses (3)
B – Drain plug

FAULT DIAGNOSIS CHART

	Symptoms	Action to be taken
Starting	Engine fails to start (battery and starter motor OK)	Replace starter inhibitor switch
	Engine fails to start in 'N' or 'P'	Adjust selector rod
	Engine can be started in all selector lever positions	Replace starter inhibitor switch
Moving off	No gearshift noticeable or no drive in any driving position	Check in line with testing instructions sub-operation 3 and 4. Carry out oil pressure test. If oil pressure OK mechanical fault: Check input shaft splines, forward clutch, rotor, if necessary dismantle and clean transmission assembly
	No gear change noticeable in selector lever 'R' position Gear change correct in 'D', '2' and '1' No drive in 'R'	Check engine braking effect in '1', if OK repair reverse and top gear clutch, if not OK remove rear servo and check together with brake band
	No gear change noticeable in 'D', '2' and '1' No drive in 'D', '2' and '1' OK in 'R'	Carry out oil pressure test. If too low in 'D', '2' and '1' check rear servo as well as forward clutch oil seals. If oil pressure OK, mechanical fault: check output shaft front planet gear assembly
	No gear change noticeable in 'D' OK in '2' and '1' No drive in 'D'	Adjust selector rod. Transmission freewheel assembly faulty. Completely dismantle and clean transmission and housing
	Very rough gear change in all positions	Adjust engine idling speed in 'D' 650–700 rev/min. Check vacuum system, carry out oil pressure test
	Vehicle creeping in all positions except 'P' and 'R'	Forward clutch locked (failing to disengage). Dismantle and clean transmission
	Loud mechanical noises when stationary in all positions	Carry out stationary converter test, actuating hand and foot brakes. No noise in 'N', noise becoming audible in 'R' and 'D' and louder when opening throttle. Replace converter, dismantle and clean transmission
	Loud mechanical noises when starting off (vehicle moving)	Drive power transmission to planet gears etc. faulty
	Slurping noises or sudden interruption of drive power when moving off	Check oil level. If oil level OK check oil pressure, oil filter. If OK check hydraulic pump
Stall testing	Stall test not feasible in 'R' and 'D' Engine revving up Gear changes OK	Check throttle system. Carry out oil pressure test. If pressure low, check first governor, then hydraulic pump
	Stall test not feasible in 'R' Engine revving up Stall test in 'D', '2' and '1' OK	Check engine braking effect in '1' if not OK check rear servo. If OK repair reverse and top gear clutch assemblies
	Stall test not feasible in 'D' Engine revving up Stall test in 'R' OK	Carry out check in '2' and '1'. If OK freewheel faulty. Dismantle and clean transmission

FAULT DIAGNOSIS CHART (cont'd)

	Symptoms	Action to be taken
Gear changing	Bad acceleration. Final speed and engine OK	Remove torque converter. Check stator
	Unsatisfactory performance Final speed not being obtained (Engine OK, acceleration OK). Oil becoming very hot	Test according to test schedule (full throttle and kickdown). If OK, remove torque converter and check freewheel operation
	With accelerator pedal moderately depressed (1500–2000 rev/min) transmission changes to 2nd gear at speed above 45 km/h (30 mph) (gear change delayed)	Check vacuum system. Carry out oil pressure test. Check governor, if OK check 1st/2nd gear shift valve. If OK check oil seals on governor hub
	With gradual acceleration (accelerator pedal moderately depressed, 1500–2000 rev/min) transmission changing directly from 1st to 3rd gear	Check front brake band adjustment, carry out oil pressure test, check front servo, check transmission housing. 1st/2nd gear shift valve
	With gradual acceleration (accelerator pedal moderately depressed : 1500–2000 rev/min) transmission fails to change to 3rd gear	Carry out oil pressure test. Check governor, check transmission housing. 2nd /3rd gear shift valve. Dismantle and clean transmission assembly
	Either no gear change occurs or starting off in 2nd or 3rd gear with selector lever in 'D'	Carry out oil pressure test. Check governor, check transmission housing, check oil seals (3) on governor hub
	Kickdown shift speeds too low Gearshift changes too early	Check kickdown cable adjustment. Carry out oil pressure test. Check governor. Check oil seals (3) on governor hub
	Shift speed too high when changing up from 1st to 2nd gear and/or 2nd to 3rd gear full throttle (kickdown) change (gear change delayed)	Carry out oil pressure test. Check governor, check transmission housing, check oil seals (3) on governor hub
	Loud whining noises at higher engine speeds	Check oil filter and check hydraulic pump and intake systems
	Transmission not changing down to 2nd gear with accelerator pedal fully depressed (kickdown) at 65 km/h (40 mph) in 'D'	Check kickdown cable adjustment. Carry out oil pressure test. Check kickdown valve in transmission housing
	Transmission not changing down to 2nd gear with accelerator pedal depressed approx. 3/4 of travel at 50 km/h (30 mph) in 'D', otherwise OK	Carry out oil pressure test, check governor, check transmission housing
	*With change from 'D' to '1' at 70 km/h (44 mph) and with accelerator pedal released no braking effect by changing back to 2nd gear	Adjust front brake band. Carry out oil pressure test. Check front servo
	*Transmission changing to 1st gear at speeds above 70 km/h (44 mph) when changing from 'D' to '1' at 50 km/h (30 mph) with accelerator pedal released	Carry out oil pressure test. Check transmission housing (shift valves), check governor
	*Transmission changing to 1st gear at speed below 25 km/h (16 mph) when shifting from 'D' to '1' at 70 km/h (44 mph) with accelerator pedal released	Carry out oil pressure test. Check transmission housing. Check rear servo. Check governor
	Parking inhibitor not operative on steep gradients	Adjust selector linkage. Check parking mechanism

*With these symptoms drive car with oil pressure gauge connected and check whether main line pressure increases (as it should do) when changing manually at 80 km/h (50 mph) from 'D' to '2' or '1'.

FAULT DIAGNOSIS CHART (cont'd)

OTHER POSSIBLE CAUSES OF FAULTS

Symptoms	Action to be taken
Selector lever difficult to move or locked	Check selector lever Check selector linkage and transmission manual shift valve Check Neutral switch Check correct seating of Code plate (on transmission housing)
Converter leaks Correct location of converter guide bush in converter housing must be ensured when replacing transmission hydraulic pump oil seal	Check : Engine rear gasket, Transmission oil pump seal, Converter housing to transmission housing bolts (with aluminium washers), Torque converter oil drain plug, Torque converter weld nuts, Torque converter welds
Transmission leaks	Check : Extension housing oil seal, Transmission side connections and circuits, Front servo adjusting screw, Selector lever and kickdown lever O-ring seals, Extension housing to transmission housing seal, Test connection, Oil sump seal, Speedometer drive sealing ring, Vacuum plug socket sealing ring
Oil loss without external leak	Replace vacuum diaphragm

General recommendations on remedial action:

1. If several possibilities of remedial action are indicated in the fault diagnosis chart in relation to any one symptom, start with the first operation specified and check results before proceeding to the next operation.
2. If more than one symptom is applicable start with the remedial action which involves the minimum workload.
3. The operation 'Dismantle and clean transmission assembly' is specified in respect of instances where faults are attributable to wear or damage. In connection with the relevant operation(s) shavings or brake band abrasive dust must be removed from **all** transmission parts in order to avoid consequential damage. In particular the torque converter, oil cooler and oil cooler pipes should be thoroughly flushed.

SPECIAL SERVICE TOOL RECOGNITION

British Sourced	European Sourced	German Sourced	Tool Name
	15-008		Dial gauge mounting block
P-4008	15-022	G2-4209-E	Dial indicator holding fixture
17-001			Transmission extension housing oil seal remover
17-002			Transmission extension housing oil seal replacer
17-005-A OR CBW-547-A-50		17-005 OR GAT-701	Brake band torque wrench
17-006			Gearbox mounting bracket
17-007			Clutch spring compressor
P-7126	17-008	GAT-706	Shift lever oil seal replacer
17-009-01			Oil pump aligner
17-010			Pump housing oil seal installer

GI412841D

SPECIAL SERVICE TOOL RECOGNITION (cont'd)

British Sourced	European Sourced	German Sourced	Tool Name
	17-011		Pump housing oil seal remover
	21-023		Universal spindle
CBW-1-C		GAT 702	Oil pressure test gauge
	17-012		Piston rod checking gauge

GJ4128JFD

SERVICE AND REPAIR OPERATIONS CONTENT – PART 'A'

		Described	Contained in operation	Unique for Transit
17 214	Automatic transmission assembly – remove and install	X		X
17 634	Gear-selector mechanism – remove and install	X		X
17 634 8	Selector lever assembly – dismantle and reassemble	X		X
17 667	Cable-selector lever – remove and install	X		X
17 683	Cable-downshift – remove and install	X		X

SERVICE AND REPAIR OPERATIONS CONTENT – PART 'B'

AUTOMATIC TRANSMISSION		Described in this publication	Contained in operation	Also applicable to certain variants in the following model ranges			
				Escort '75 onwards	Capri II	Taunus '76 Cortina '77	Consul Granada
17 111	Automatic transmission assembly – check	X		X	X	X	X
17 132	Brake band – front – adjust	X		X	X	X	X
17 214 8	Automatic transmission assembly – overhaul (transmission removed)	X		X	X	X	X
17 234 4	Valve body assembly – remove and install (sump removed)	—	17 214 8	X	X	X	X
17 238	Vacuum diaphragm – remove and install	X		X	X	X	X
17 252	Servo assembly – front – remove and install	X		X	X	X	X
17 256	Servo assembly – rear – remove and install	X		X	X	X	X
17 274 4	Pump – front – remove and install (transmission removed)	—	17 214 8	X	X	X	X
17 354	Governor – remove and install	X		X	X	X	X
17 376	Seal – extension housing – replace	X		X	X	X	X
17 382	Gear – speedometer driven – remove and install	X		X	X	X	X
17 682	Cable – downshift – adjust	-	17 683	X	X	X	X
17 694	Inhibitor switch – remove and install	X		X	X	X	X

SERVICE AND REPAIR OPERATIONS - PART 'A'

17 214 AUTOMATIC TRANSMISSION ASSEMBLY – REMOVE AND INSTALL

Special Service Tools Required: None

To Remove

1. Drive vehicle over pit or on to ramp.
2. Disconnect earth cable from battery.
3. Remove exhaust pipe from exhaust manifold, unhook assembly from rear retaining strap and swing to side.

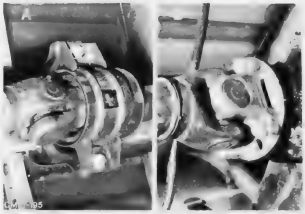

Fig. 16. Driveshaft fixing
A – Centre bearing
B – Rear axle flange

4. Remove driveshaft assembly, Fig. 16 (6 bolts). To prevent oil loss slide driveshaft stub or output shaft dust cap into gearbox extension housing, Fig. 17.
It should be possible for dust cap and/or driveshaft stub to freely slide into extension housing. Cap and/or stub should be clean and have no sharp edges.

Fig. 17. Output shaft dust cap

5. Disconnect oil cooler pipes from transmission housing, Fig. 18. Plug pipe ends to prevent dirt from penetrating into oil pipes.

Fig. 18. Oil pipes, transmission to cooler

PART 'A'

17 214 (cont'd)

6. Disconnect vacuum pipe from vacuum diaphragm, Fig. 19.

Fig. 19. Vacuum diaphragm

7. Remove selector lever cable from transmission lever (split pin) and bracket, Fig. 20.

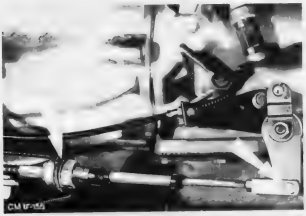

Fig. 20. Remove selector lever cable

8. Remove downshift cable from transmission downshift lever and bracket, Fig. 21.

9. Disconnect cable from starter inhibitor switch.

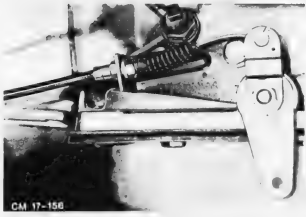

Fig. 21. Disconnect downshift cable from transmission and bracket

PART 'A'

10. Remove speedometer drive cable from extension housing (1 bolt), Fig. 22.

11. Disconnect starter motor cable and remove starter motor assembly (2 bolts).

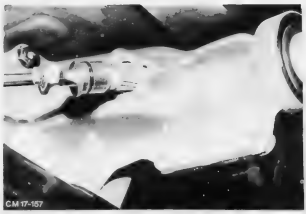

Fig. 22. Speedometer drive cable removed

12. Remove cover plate with cable bracket from converter housing (4 bolts), Fig. 23.

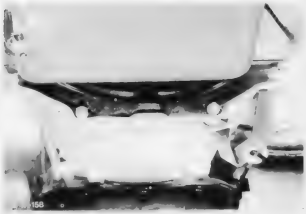

Fig. 23. Remove cover plate and selector cable bracket

13. Remove torque converter drive plate bolts (3) through starter motor aperture, Fig. 24.

Fig. 24. Remove torque converter drive plate bolt through starter motor aperture

PART 'A'

17 214 (cont'd)

14. Disconnect oil filler pipe from engine (1 bolt) then withdraw from transmission housing, Fig. 25.
To protect transmission from dirt penetration, plug oil filler opening.

Fig. 25. Oil filler pipe

15. Remove downshift cable bracket assembly from engine block (2 bolts), Fig. 26.

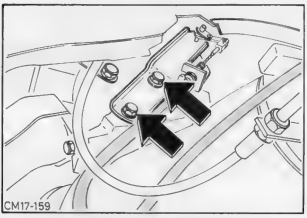

Fig. 26. Remove downshift cable bracket

16. Remove transmission support bracket from transmission and body (5 bolts), Fig. 27, supporting transmission during removal.
17. Remove transmission flange bolts (5) and place earth strap together with vacuum pipe bracket on one side.
18. Carefully lower transmission assembly and remove.

NOTE: Torque converter is filled with oil and should therefore be pressed firmly against transmission when lifting out transmission.

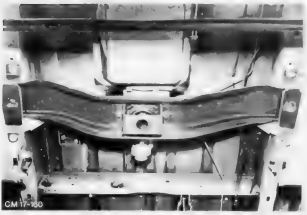

Fig. 27. Transmission support bracket

PART 'A'

To Install

Tighten all bolts and nuts to specified torque.

If necessary place adapter plate on engine flange guide bushes and centralise.

19. Replace transmission and torque converter. **When installing transmission attention should be paid to the following points:**

    (a) Converter oil drain plug must be aligned on drive plate opening.

    (b) With torque converter hub fully engaged in oil pump drive gear distance 'A' between converter casing flange and centring pivot should be **at least 10 mm (0,4 in),** Fig. 28. **Strict compliance with converter installation instruction is essential to prevent damage to transmission and flywheel assemblies.**

    NOTE: With converter casing flush with engine block converter should rotate easily. Only then should flange bolts be fitted and tightened.

20. Fit transmission flange bolts, at the same time securing earth strap and vacuum pipe bracket.

21. Fit transmission support bracket assembly to body and transmission, Fig. 29, and torque to specification.

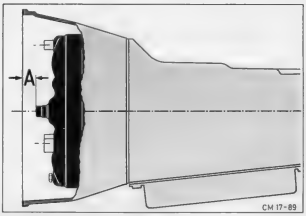

Fig. 28. Converter installation dimension 'A'

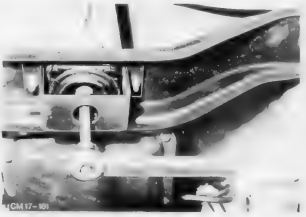

Fig. 29. Fit transmission support bracket assembly

22. Attach downshift cable bracket to engine block, Fig. 30.

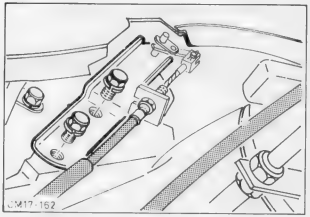

Fig. 30. Fit downshift cable bracket

PART 'A'

17 214 (cont'd)

23. Insert oil filler tube with sealing lip into transmission housing and attach to engine block with flange bolt.

24. Fit torque converter to drive plate and tighten bolts (3), Fig. 31.

Fig. 31. Torque converter to drive plate bolt

25. Bolt cover plate and gearshift cable to converter casing.

26. Install starter motor and connect cable.

27. Connect speedometer cable to transmission, Fig. 32.

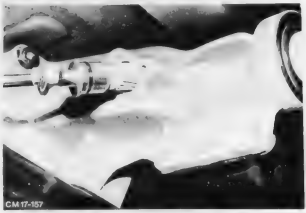

Fig. 32. Connect speedometer cable

28. Connect cable to starter inhibitor switch.

29. Fit downshift cable to downshift lever and bracket and adjust (see Operation 17 682), Fig. 33.

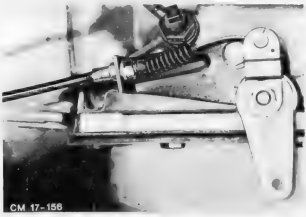

Fig. 33. Fit downshift cable

PART 'A'

30. Attach selector lever cable to transmission lever and bracket and adjust (see Operation 17 667), Fig. 34.

31. Connect vacuum pipe to vacuum diaphragm.

Fig. 34. Fit selector lever cable

32. Remove plug and attach oil pipes to transmission, Fig. 35.

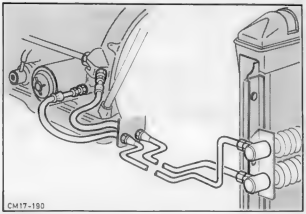

Fig. 35. Connect oil pipes to transmission

33. Remove plug from extension housing and fit driveshaft **without strain**, Fig. 36.
34. Fit exhaust pipe to exhaust manifold and hook into rear retaining strap.
35. Connect battery earth strap.
36. Top up with specified transmission oil (see 'Service Adjustments and Checks').

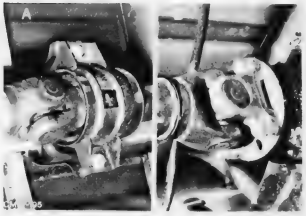

Fig. 36. Driveshaft installed
A – Centre bearing
B – Rear axle flange

PART 'A'

17 634 GEAR SELECTOR LEVER ASSEMBLY – REMOVE AND INSTALL

To Remove

1. Disconnect battery earth strap.
2. Remove instrument cluster cowl (2 bolts front, clipped in on top).
3. Remove instrument cluster complete with cover plate (2 bolts), Fig. 37. Disconnect cable connections and speedometer drive cable and lift out instrument cluster assembly.

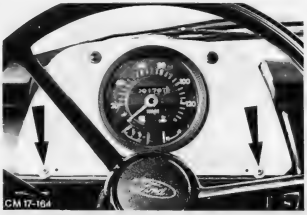

Fig. 37. Remove instrument cluster assembly

4. Remove selector lever knob.
5. Prise off selector lever escutcheon (clipped in at 3 points), Fig. 38.

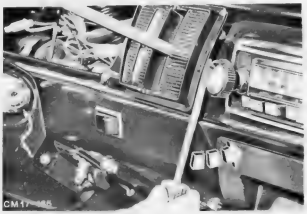

Fig. 38. Lift off selector lever escutcheon

6. Remove escutcheon illumination.
7. Remove demister nozzle (inside left), (2 bolts), Fig. 39.
8. Remove fresh air and demister nozzle hoses (outside left) from distributor box and place on side.
9. Disconnect and remove heater control switch.
10. Disconnect and remove heated rear window switch (where fitted).

Fig. 39. Remove demister nozzle

PART 'A'

11. Disconnect selector cable from shift selector lever (1 split pin).

12. Remove selector lever with housing from instrument panel (6 bolts), Fig. 40.

Fig. 40. Remove selector housing bolts

To Install

13. Fit selector lever with housing and bolt to instrument panel, commencing with bottom bolts.

14. Attach selector cable to shift selector lever (1 split pin), Fig. 41.

15. Fit heated rear window switch and connect cable (where fitted).

16. Connect fresh air and demister nozzle hoses (outside left) to distributor box.

17. Fit demister nozzle (inside left).

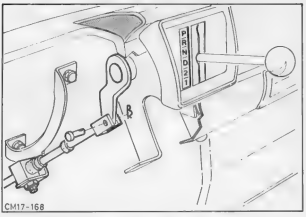

Fig. 41. Connect selector cable to shift selector lever

18. Fit escutcheon illumination assembly and install selector lever escutcheon, Fig. 42.

19. Connect cables and speedometer drive cable and fit instrument cluster complete with cover plate.

20. Fit instrument cluster cowl.

21. Fit selector lever knob.

22. Connect battery earth strap.

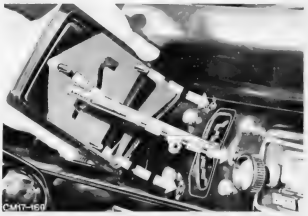

Fig. 42. Fit selector lever escutcheon

PART 'A'

17 634 8 SELECTOR LEVER ASSEMBLY – DISMANTLE AND REASSEMBLE (selector lever removed)

Special Service Tools Required: None

To Dismantle

1. Remove selector lever clip from selector housing (2 bolts), Fig. 43.

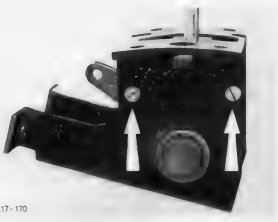

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Fig. 43. Remove selector lever clip

2. Remove retaining clamp from yoke and slide selector lever through shift shaft installation aperture downwards and out, Fig. 44.

3. Remove selector lever yoke from shift shaft (1 split pin).

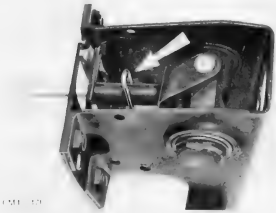


Fig. 44. Remove retaining clamp

4. Remove shift shaft from selector housing (1 circlip).

5. Press shift shaft bushes out of selector housing, using suitable length of tubing, Fig. 45.

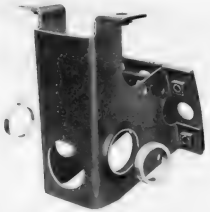


Fig. 45. Press out shift shaft bushes

PART 'A'

To Reassemble

6. Drive shift shaft bushes flush with selector housing.

7. Install shift shaft (lightly greased) in housing and secure with circlip, Fig. 46.

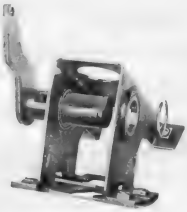


Fig. 46. Install and secure shift shaft

8. Fit selector lever yoke to selector lever (1 split pin), Fig. 47.

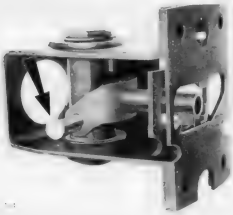


Fig. 47. Fit selector lever yoke

9. From underside insert selector lever through shift shaft installation aperture, with the selector lever lock pin engaging in the yoke recess, Fig. 48. Secure selector lever by means of retaining clamp.

10. Attach selector lever clip and guide bushes to selector housing, using 2 bolts.

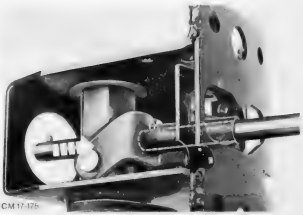


Fig. 48. Fit selector lever

PART 'A'

17 667 SELECTOR CABLE – REMOVE AND INSTALL

Special Service Tools Required: None

To Remove

1. Disconnect battery earth strap.
2. Remove selector cable from transmission lever (1 split pin).
3. Remove selector cable from converter housing bracket. Back off selector cable locking nut and unhook cable from bracket, Fig. 49.

Fig. 49. Remove selector lever cable

4. Remove instrument cluster cowl (2 front bolts, clip in top fitting).
5. Remove instrument cluster complete with cover plate (2 bolts). Disconnect cables and speedometer drive cable and lift out instrument cluster assembly, Fig. 50.

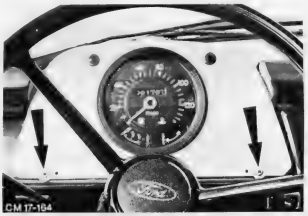


Fig. 50. Remove instrument cluster

6. Disconnect and remove heater blower switch.
7. Remove selector cable from shift shaft bracket (1 split pin), Fig. 51.

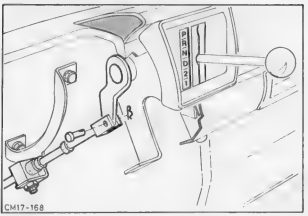


Fig. 51. Disconnect selector cable (split pin)

PART 'A'

8. Remove selector cable from heater assembly bracket (1 nut) and lift out cable assembly, Fig. 52.

To Install

9. Fit cable assembly and attach to heater assembly bracket (ensuring correct location and paying attention to rubber grommet).
10. Attach selector cable to shift shaft lever.
11. Connect heater assembly switch and install.

Fig. 52. Disconnect selector cable from heater assembly bracket

12. Connect cables and speedometer drive cable and fit instrument cluster complete with cover plate.
13. Fit instrument cluster cowl, Fig. 53.

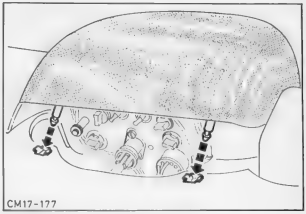


Fig. 53. Fit instrument cluster cowl

14. Engage selector lever in 'D' position, Fig. 54.

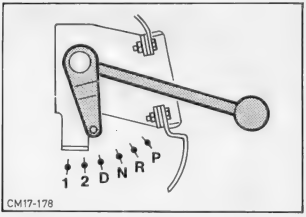


Fig. 54. Selector lever in 'D' position

PART 'A'

15. Move transmission selector lever to 'D' position, Fig. 55 (2 notches from front abutment).

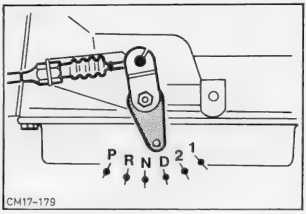


Fig. 55. Transmission selector lever in 'D' position

16. Fit selector cable to converter housing bracket and adjust cable in such a manner that split pin may be inserted into transmission lever **without strain**, Fig. 56. Tighten lock nut.

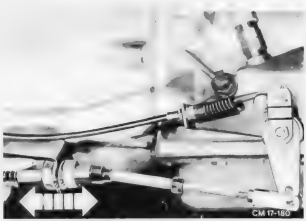


Fig. 56. Adjust cable

17. Connect selector cable to transmission selector lever and secure, Fig. 57.
18. Connect battery earth strap.
19. Using manual gearshift lever check whether all positions are obtainable and engagement can be felt. If necessary readjust cable.

Fig. 57. Fit cable

PART 'A'

17 683 DOWNSHIFT CABLE – REMOVE AND INSTALL

Special Service Tools Required: None

To Remove

1. Remove air filter.
2. Disconnect cable top end from carburettor linkage connecting lever (split pin), Fig. 58.

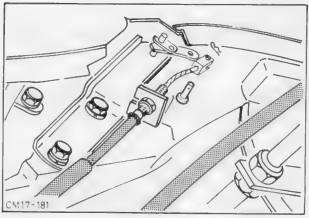


Fig. 58. Disconnect downshift cable from carburettor linkage connecting lever

3. Remove outer cable from top bracket. Unscrew adjusting nut from threaded coupling, pull outer cable right back and unhook from bracket (slot), Fig. 59.

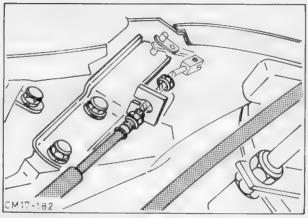


Fig. 59. Unhook outer cable from bracket (slot)

4. Remove outer cable from transmission bracket. Unscrew nut from threaded coupling and unhook cable from bracket (slot), Fig. 60.
5. Unhook cable from transmission downshift lever and withdraw cable assembly.

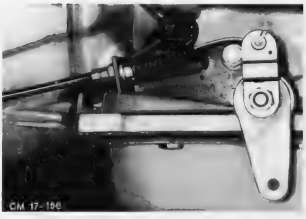


Fig. 60. Remove downshift cable from transmission and bracket

PART 'A'

To Install

6. Reconnect cable to transmission downshift lever.

7. Fit outer cable to transmission bracket and install cable, Fig. 61.

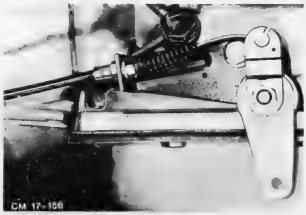


Fig. 61. Fit outer cable to transmission bracket

8. Locate threaded coupling in upper bracket. Inner nut must be screwed completely on to threaded coupling, outer nut only a few turns, Fig. 62.

9. Connect cable to carburettor linkage connecting lever (1 split pin).

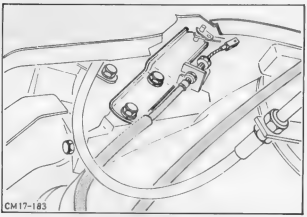


Fig. 62. Connect outer cable to upper bracket

10. Adjust downshift cable.
Before adjusting downshift cable check that the throttle plate is fully open when accelerator pedal is completely depressed.
Depress accelerator pedal far enough for throttle plate to fully open. Using screwdriver then press downshift cable lever away from operating shaft lever and shorten or lengthen cable by means of adjusting screws until clearance of 0,5 to 1,3 mm (0,02 to 0,05 in) is obtained between operating shaft lever and downshift cable, Fig. 63. Tighten lock nuts.

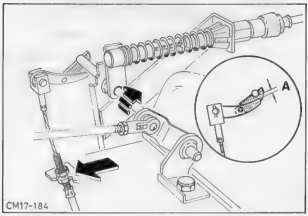


Fig. 63. Adjust downshift cable
A – 0,5 to 1,3 mm (0,02 to 0,05 in)

SERVICE AND REPAIR OPERATIONS – PART 'B'

17 111 AUTOMATIC TRANSMISSION ASSEMBLY – CHECK

Special Service Tools Required: None

1. Engine should start with selector lever in positions 'P' and 'N' only.
2. A slight response must always be felt when selecting positions R, D, 2 and 1.
3. Stall speed in selector positions 'D' and 'R' must be below 2600 rev/min. Unless fitted to the vehicle, connect a tachometer to the engine, locating the tachometer where it can be easily read from the driver's seat. Firmly apply the handbrake and actuate the foot brake.

   NOTE: The stall speed check must not be allowed to exceed 5 seconds, with intervals of approx. 15 seconds in position 'N'.
4. With gentle acceleration in position 'D' (accelerator pedal slightly depressed) and road speed below 45 km/h (28 mph) the transmission must change from 1st to 2nd gear and with road speed 60 km/h (37 mph) from 2nd to 3rd gear.
5. At full throttle (with kickdown) engine speed with changes from 1st to 2nd gear and from 2nd to 3rd gear should be 5300 rev/min.

   If, owing to local conditions, the speeds associated with the change from 2nd to 3rd gear are not practicable the following test should be carried out: If the accelerator pedal is fully depressed at 75 km/h (46 mph) (kickdown) with the selector lever in position 'D' the transmission must change down to 2nd gear.
6. At 50 km/h (30 mph) road speed, with the selector lever in position 'D' and the accelerator pedal depressed approximately three-quarters of its travel the transmission must change down to 2nd gear.
7. With gear change from 'D' to '1' at 90 km/h (56 mph) and accelerator pedal released the transmission should immediately change to 2nd gear and between 75 and 25 km/h (45 to 15 mph) an automatic downshift to 1st gear should occur.
8. When parking the vehicle on steep gradients engagement of the parking inhibitor gear must prevent any movement of the car. (Selector position 'P'.)

17 132 BRAKE BAND – FRONT – ADJUST

Special Service Tools Required:

Brake band torque wrench 17–005

1. Disconnect downshift cable from transmission downshift lever.
2. Slacken lock nut of adjustment screw and slacken adjustment screw by a few turns.
3. With torque wrench, Tool 17–005, tighten adjustment screw until wrench releases, Fig. 64.
4. **Slacken adjustment screw by 1¼ turns and tighten lock nut.** The adjusting screw should not turn.
5. Replace downshift cable to downshift lever.

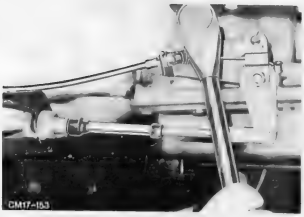


Fig. 64. Adjust brake band

PART 'B'

TRANSMISSION – EXPLODED VIEW

Fig. 65.

1. Filter
2. Gasket
3. Rear servo assembly
4. Valve body
5. Cover plate
6. Front servo assembly
7. Housing-dashpot
8. Throttle valve
9. Inhibitor switch
10. Interlock and parking mechanism
11. Oil seal
12. Parking pawl
13. Governor assembly
14. Piston rings
15. Thrust washer No. 8
16. Governor hub
17. Circlip
18. Output shaft
19. Free-wheel clutch
20. Thrust washer No. 7
21. Brake band
22. Brake drum
23. Rear planet gear
24. Thrust washer No. 6
25. Input bell housing
26. Front planet gear
27. Forward clutch
28. Thrust washer No. 3
29. Sun gear
30. Reverse and direct drive clutch
31. Sealing ring
32. Oil pump
33. Oil pump gears.
34. Intermediate plate
35. Torque converter
36. Input shaft
37. Thrust washer No. 1

PART 'B'

17 214 8 AUTOMATIC TRANSMISSION ASSEMBLY – OVEHAUL (Transmission Removed)

Special Service Tools Required:

Transmission extension housing oil seal remover	17–001
Transmission extension housing oil seal replacer	17–002
Brake band torque wrench	17–005
Transmission mounting bracket	17–006
Clutch spring compressor	17–007
Selector lever oil seal replacer	17–008
Oil pump aligner	17–009–01
Pump housing oil seal installer	17–010
Pump housing oil seal remover	17–011
Piston rod checking gauge	17–012
Dial gauge mounting block	15–008

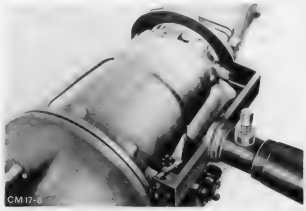


Fig. 66. Transmission with bracket 17–006 on stand

To Dismantle

1. Remove torque converter and withdraw input shaft. The oil removed from converter or residues contained in it, may be useful for diagnostic purposes (see also **Converter test and clean** under **General**). Mount transmission, with mounting bracket 17–006 on stand, Fig. 66.
2. In order to prevent oil sludge and swarf from penetrating into gearbox, remove oil sump (still filled with oil) downward (13 bolts), Fig. 67.

Fig. 67. Remove sump pan bolts

3. Swing transmission through 180° and remove filter (3 bolts), Fig. 68. Remove gasket.
4. Remove interlock spring (1 bolt), Fig. 68.

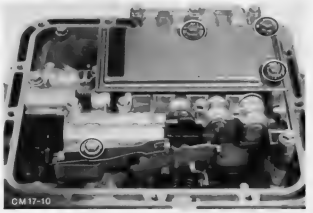


Fig. 68. Oil filter and interlock spring bolts

PART 'B'

17 214 8 (cont'd)

5. Slackening bolts (4) evenly, remove spring-loaded servo cover, Fig. 69. Remove servo piston and spring. Watch out for oil.

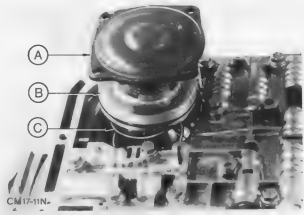


Fig. 69. Rear servo
A – Servo cover
B – Servo piston
C – Spring

6. Remove bolts (14) from valve body, Fig. 70. Raise valve body slightly and move it sideways so that selector lever connecting link slides out of manual selector stick. Remove valve body and gasket.

   Manual selector slide may slide out of valve body.

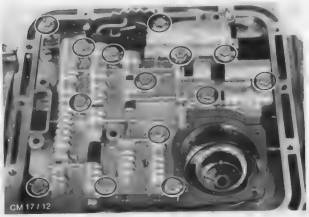


Fig. 70. Valve body bolts

7. Remove pump oil seal using Tool 17–011, holding tool with a spanner, Fig. 71.

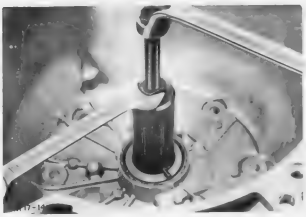


Fig. 71. Remove pump oil seal using Tool 17–011

PART 'B'

8. Turn transmission into vertical position. Unbolt converter casing (8 bolts with aluminium washers) and remove complete with pump, Fig. 72. Remove thrust washer No. 1, gasket and sealing ring.

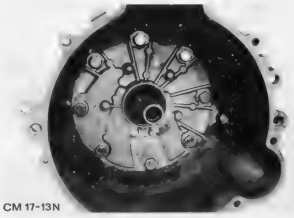


Fig. 72. Converter casing bolts

9. Detach pump from converter casing (5 bolts) and remove with intermediate plate, Fig. 73A. Mark oil pump gear engagement and then remove the gears. Check pump body for wear (suction/delivery side). See Fig. 73B.

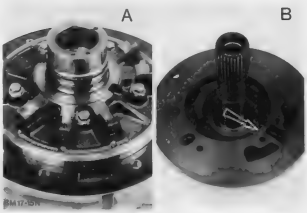


Fig. 73. A – Pump body bolts B – Pump body wear

10. Before proceeding further, measure end-float of assembly:

Position pump body together with thrust washer No. 1 in transmission housing, making sure that front assembly is correctly engaged.

Place gauge block 15–008 with dial gauge, on pump body. Set dial gauge to '0', Fig. 74.

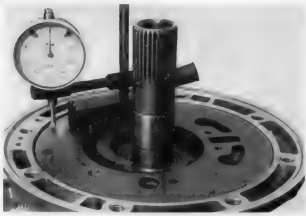


Fig. 74. Set dial gauge on pump body to '0'

PART 'B'

17 214 8 (cont'd)

Position plunger of dial gauge on transmission housing. Note reading, Fig. 75.

Repeat procedure at point opposite. If second reading differs from first, add two together and divide by two to obtain mean. This should be within specified tolerance of 0,20 to 0,80 mm (0,008 to 0,032 in). If it is not, a different size thrust washer No. 1 should be used during subsequent reassembly.

Remove pump and thrust washer.

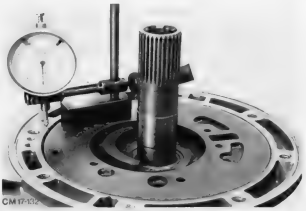


Fig. 75. Dial gauge on transmission housing

11. Turn transmission into horizontal position. Slacken lock nut and remove brake band adjustment screw. Take out brake band struts (2) and brake band. (To facilitate removal and reinstallation, brake band may be held with a brass clip, Fig. 76.)

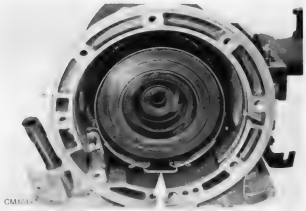


Fig. 76. Brake band with brass clip fitted

12. Remove front assembly and thrust washer No. 5, Fig. 77.

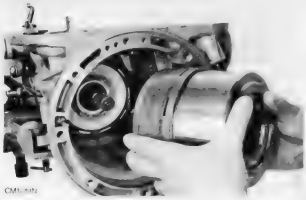


Fig. 77. Remove front assembly

PART 'B'

13. Press front servo cover **slightly** inwards and remove circlip. Carefully push servo piston out with compressed air, Fig. 78. It may be necessary to cover up the two bores. Watch out for oil leakage. Separate piston from cover.

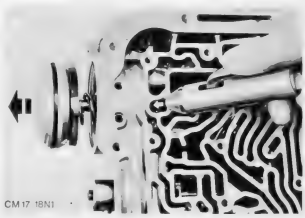


Fig. 78. Use compressed air to remove servo piston

14. Remove extension housing bolts (6). Remove extension housing together with gasket, Fig. 79. Remove parking pawl return spring together with pawl. Remove bolt from extension housing.

Fig. 79. Remove extension housing

15. Remove large circlip from rear planet carrier, Fig. 80. Take out planet carrier together with thrust washer No. 5. Then remove small circlip from output shaft, Fig. 80.

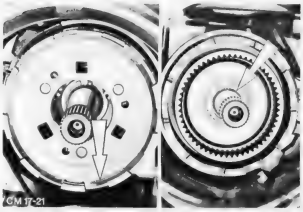


Fig. 80. Planet carrier circlip and output shaft circlip

PART 'B'

17 214 8 (cont'd)

16. Withdraw output shaft complete with governor and thrust washer No. 8 from rear, Fig. 81.

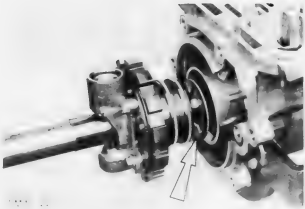


Fig. 81. Output shaft complete with governor and thrust washer No. 8

17. Take out annulus, brake drum, rear brake band and thrust washer No. 7 from transmission housing, Fig. 82.

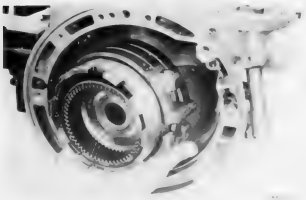


Fig. 82. Remove annulus, brake drum and rear brake band

18. Remove one-way clutch inner ring (5 Allen screws), Fig. 83. Check inner ring for wear.

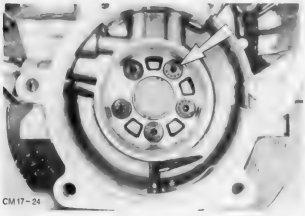


Fig. 83. One-way clutch inner ring Allen screws

PART 'B'

19. Remove bolt securing vacuum diaphragm retainer to transmission housing. Remove vacuum diaphragm and actuating pin, then withdraw throttle valve from housing with aid of a magnet. Remove O-ring from diaphragm, Fig. 84.

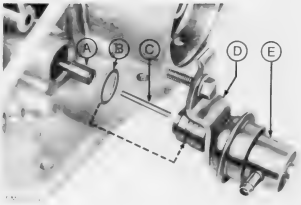


Fig. 84. Remove vacuum diaphragm
A – Throttle valve
B – O-ring
C – Actuating pin
D – Vacuum diaphragm retainer
E – Vacuum diaphragm

20. Unscrew starter inhibitor switch and remove O-ring, Fig. 85. Remove downshift cable bracket.

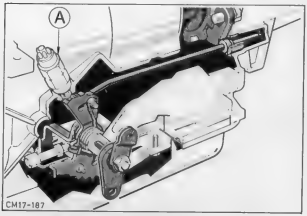


Fig. 85. Interlock and parking pawl mechanism
A – Starter inhibitor switch

Selector Lever Oil Seal – Renew

21. Remove downshift lever and press downshift lever shaft inwards. Remove O-ring. Withdraw selector lever locking pin with pliers. Remove inner selector lever nut and press off interlock. Release and remove parking pawl actuating rod. Remove selector lever from outside and downshift lever shaft from inside, Fig. 86. Carefully prise oil seal out with a screwdriver.

A – Manual selector slide
B – Downshift lever shaft
C – Parking pawl actuating rod
D – Torsion spring
E – Clip
F – Selector lever
G – O-ring
H – Downshift lever
J – Pin
K – Lock washer
L – Interlock
M – Tie rod

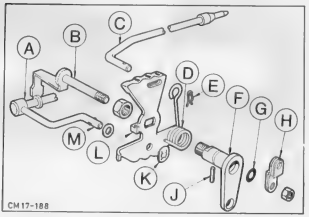


Fig. 86. Interlock and parking pawl assembly dismantled

PART 'B'

17 214 8 (cont'd)

22. Fit a new oil seal using Tool 17–008, Fig. 87. Install downshift lever shaft with nut on it, shift stop and spring from inside and selector lever from outside.

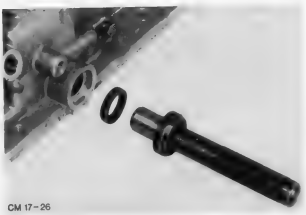
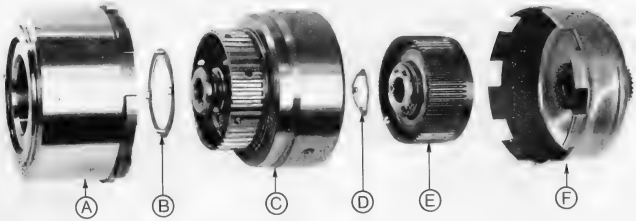


Fig. 87. Press in oil seal using Tool 17–008

Dismantle Front Assembly, Fig. 88

23. Take off input bell-housing complete with sun gear. Take out planet carrier together with annulus and thrust washer No. 3. Remove forward clutch together with thrust washer No. 2. (Reverse and top gear clutch remain.) If necessary remove sun gear after having removed locking plate and renew thrust washer No. 6.



CM 17–119 N

Fig. 88. Front assembly dismantled
A – Reverse and top gear clutch
B – Thrust washer No. 2
C – Forward clutch
D – Thrust washer No. 3
E – Annulus with hub and circlip
F – Input bell-housing with sun gear and thrust washer No. 6

PART 'B'

Dismantling Reverse and Top Gear Clutch

24. Remove pressure plate circlip, Fig. 91, and take out plate pack. Compress springs using Tool 17–007, Fig. 89, remove circlip, slowly release springs and take out springs and spring retainer.

Fig. 89. Compress springs using Tool 17–007

Withdraw hydraulic piston by hand or, if necessary, push it out with compressed air applied through channel in pump body, Fig. 90. Remove sealing rings from piston.

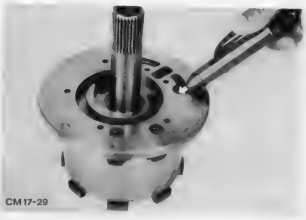


Fig. 90. Remove hydraulic piston using compressed air

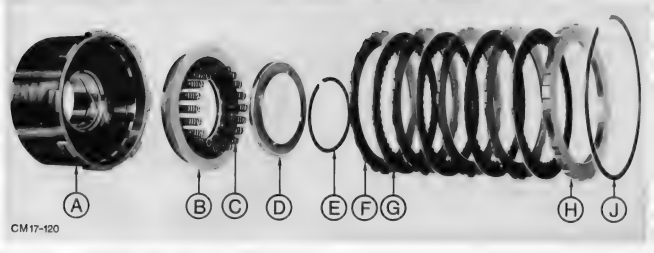


Fig. 91. Reverse and top gear clutch dismantled
A – Clutch body
B – Hydraulic piston with sealing rings
C – Springs (20-off)
D – Spring retainer
E – Circlip
F – Secondary clutch plate
G – Primary clutch plate
H – Retaining plate
J – Circlip

PART 'B'

17 214 8 (cont'd)

Assembly of Reverse and Direct Drive Clutch

Inspect secondary and primary clutch plates for wear damage or effects of overheating and if necessary renew whole plate pack. Immerse new clutch plates in automatic transmission fluid for ½ hour before fitting.

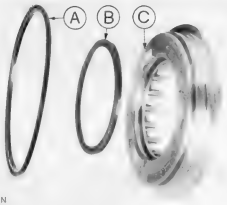


Fig. 92. Reverse and top gear clutch piston
A – Sealing ring (outer)
B – Sealing ring (inner)
C – Clutch piston

25. Fit new sealing rings on piston, Fig. 92, sealing lips facing compression chamber. Carefully insert clutch piston moving it gently to and fro. Fit springs (20) and spring retainer. Compress springs using Tool 17–007 and insert circlip. Remove tool. Insert clutch plates in correct order (secondary, primary (lined), alternately), fit retaining plate, Fig. 91, and secure with a circlip. Press clutch plates tightly together and measure clearance between circlip and pressure plate with a feeler gauge, Fig. 93.

If clearance is outside specified limits, 1,4 to 2,1 mm (0,055 to 0,083 in), an appropriate circlip should be fitted (for selection, see Parts Catalogue).

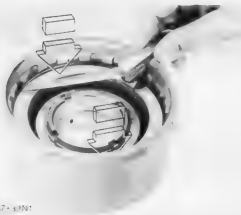


Fig. 93. Measure clearance between circlip and pressure plate

Dismantling Forward Clutch

26. Remove circlip in front of pressure plate and take out plate pack together with corrugated washer. Compress springs using Tool 17–007, Fig. 94, taking care not to damage piston. Remove circlip and carefully release springs. Take out spring retainer together with springs.

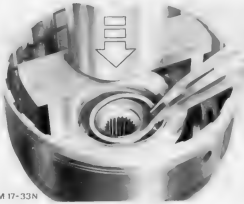


Fig. 94. Compress springs using Tool 17–007

PART 'B'

Turn clutch body round and insert pump stub into clutch body. Carefully blow compressed air into pump port shown and push piston out, Fig. 95. Remove pump. Remove rubber sealing rings from piston and, if necessary, piston rings from clutch body.

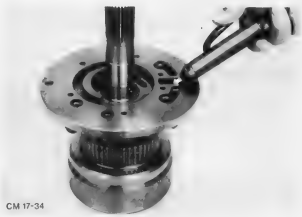


Fig. 95. Remove clutch piston using compressed air

Assembling Forward Clutch

Check primary and secondary clutch plates for wear, damage due to overheating and renew whole plate pack if necessary. Immerse new clutch plates in automatic transmission fluid for ½ hour before fitting.

27. Lubricate new sealing rings with automatic transmission fluid and fit them on to clutch piston. Press piston in **carefully** by hand, slowly rotating it.

    Insert springs (15) and spring retainer, Fig. 96. Compress springs using Tool 17–007 and fit circlip. Insert corrugated washer and then clutch plates in correct order (grooved washer secondary and primary, alternately), fit pressure plate, Fig. 97, and secure with a circlip. Measure clearance between circlip and pressure plate as described in sub-operation 25 and correct if necessary.

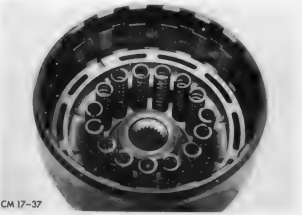


Fig. 96. Clutch body and piston, with springs fitted

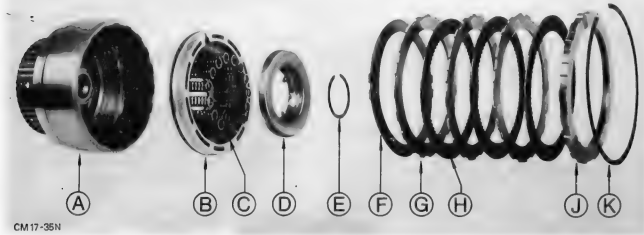


Fig. 97. Forward clutch, dismantled

A – Clutch body
B – Hydraulic piston with sealing rings
C – Springs (15 off)
D – Spring retainer
E – Circlip
F – Corrugated washer
G – Secondary plate
H – Primary plate
J – Pressure plate
K – Circlip

PART 'B'

17 214 8 (cont'd)

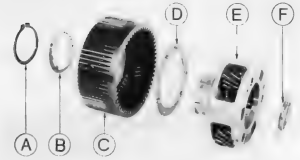
Carefully fit new piston rings on to clutch stub, Fig. 98.

CM17-134

Fig. 98. Clutch stub sealing rings

Dismantling Front Planet Gear Assembly

28. Remove circlip and annulus plus planet carrier and take off thrust washer No. 4. Separate annulus from planet carrier and remove thrust washer No. 5, Fig. 99.



A – Circlip
B – Thrust washer No. 4
C – Annulus with hub and circlip
D – Thrust washer No. 5
E – Planet carrier
F – Needle bearing thrust washer

CM17-38N

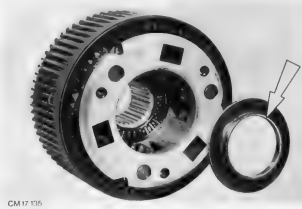
Fig. 99. Front planet gear assembly dismantled

Assembling Front Planet Gear Assembly

29. Renew damaged parts if necessary. Stick thrust washer No. 5 on to planet carrier with aid of automatic transmission fluid and insert them together into annulus. Fit thrust washer No. 4 and secure it with circlip.

NOTE: Annulus should be able to rotate freely on planet carrier.

Needle bearing should be renewed only complete with planet carrier. If needle bearing thrust washer is removed, it should be refitted with collar facing sun gear, Fig. 100.



CM17-135

Fig. 100. Needle bearing thrust washer

PART 'B'

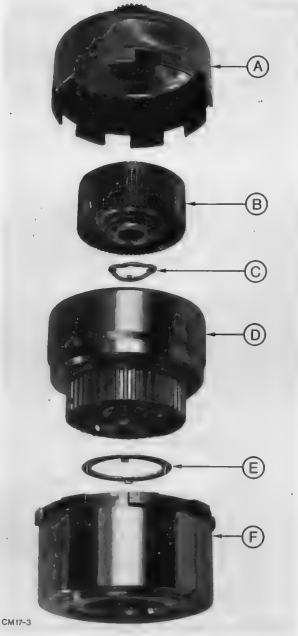


Fig. 101. Front assembly dismantled
A – Input bell-housing with sun gear and thrust washer No. 6
B – Annulus with front planet gear
C – Thrust washer No. 3
D – Forward clutch
E – Thrust washer No. 2
F – Reverse and top gear clutch

Assembling Front Assembly

30. Place reverse and top gear clutch vertically on an assembly bench. Fit thrust washer No. 2 and insert forward clutch (together with the planet gear assembly previously fitted). Stick thrust washer No. 3 to planet carrier with grease (vaseline) and insert together with annulus into forward clutch. During assembly, rotate hub of forward clutch slightly so that reverse and top gear clutch plate pack engages. Insert sun gear in planet carrier and body of reverse and top gear clutch, Fig. 101.

Dismantling and Reassembling One-way Clutch

31. Remove one-way clutch circlip from brake drum. Take out roller cage with springs and rollers (10), Fig. 102. (Springs are pushed on to cage.)

    Fit roller cage and springs and secure with circlip. Compress springs with screwdriver and fit rollers.

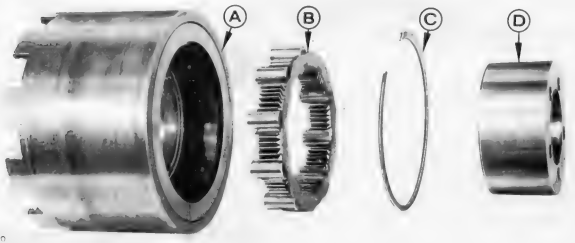


Fig. 102. Freewheel mechanism (exploded)
A – Rear brake drum with outer freewheel ring
B – Roller cage with fitted springs and rollers
C – Circlip
D – Inner freewheel ring

PART 'B'

17 214 8 (cont'd)

When refitting rollers make sure that each roller is in contact with end of spring.

With inner ring fitted, check operation of one-way clutch, Fig. 103A.

Fit one-way clutch complete with rear brake drum (5 Allen screws), Fig. 103B.

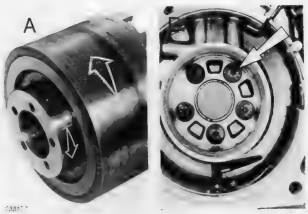


Fig. 103. A – Check operation of one-way clutch
B – Clutch inner ring recuring bolts

Dismantling and Reassembling Governor

32. Remove circlip from governor rod (without damaging bearing surface of rod) and withdraw rod. Take out governor valve and detach governor from governor hub, Fig. 104. Remove governor body from output shaft from rear and governor hub from output shaft from front. Remove circlip from governor body and take out flyweights. Remove circlip from outer flyweight and take out spring and inner weight. Clean all parts, renewing them if worn. Remove piston rings from governor hub and carefully fit new rings. Piston ring gaps must always be checked prior to fitting piston rings. Reassemble governor in reverse order using a new spring clip, Fig. 105. After reassembly, check:

(a) that spring clip is up against outer shoulder on governor rod;

(b) that governor valve and two flyweights move freely.

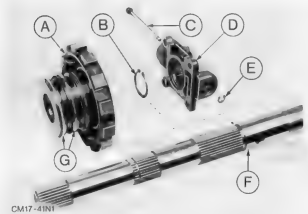


Fig. 104. Output shaft with governor and governor hub
A – Governor hub
B – Circlip
C – Governor rod
D – Governor body
E – Spring clip
F – Output shaft
G – Piston rings

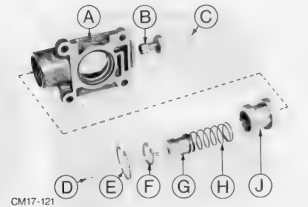


Fig. 105. Governor body dismantled
A – Governor body
B – Governor valve
C – Spring clip
D – Governor rod
E – Circlip
F – Circlip
G – Inner flyweight
H – Governor spring
J – Outer flyweight

PART 'B'

Servo Piston

33. If necessary renew 'O'-rings of front servo piston, Fig. 106.

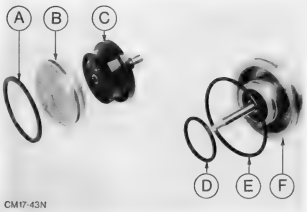


Fig. 106. Front and rear servo pistons
A – O-ring
B – Servo cover
C – Front servo piston
D – O-ring
E – O-ring
F – Rear servo piston

To Reassemble Transmission

NOTE: Before reassembly, lightly lubricate all sliding parts with specified automatic transmission fluid.

During reassembly stick thrust washers on to mating parts, using vaseline, Fig. 109.

34. Press a new hydraulic pump oil seal into converter housing using Tool 17–010, Fig. 107.

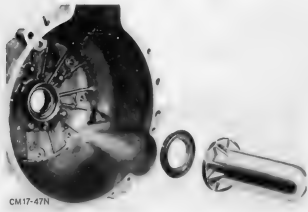


Fig. 107. Press in hydraulic pump oil seal using Tool 17–010

35. Fit throttle valve (with bore facing outwards) and install actuating pin and vacuum diaphragm with a new 'O'-ring, Fig. 108. Fit bracket (1 bolt). Diaphragm should be firmly up against housing. Bracket should not be distorted.

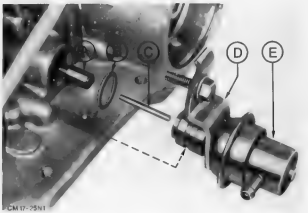


Fig. 108. Fit vacuum diaphragm
A – Throttle valve
B – O-ring
C–Actuating pin
D – Vacuum diaphragm bracket
E – Vacuum diaphragm

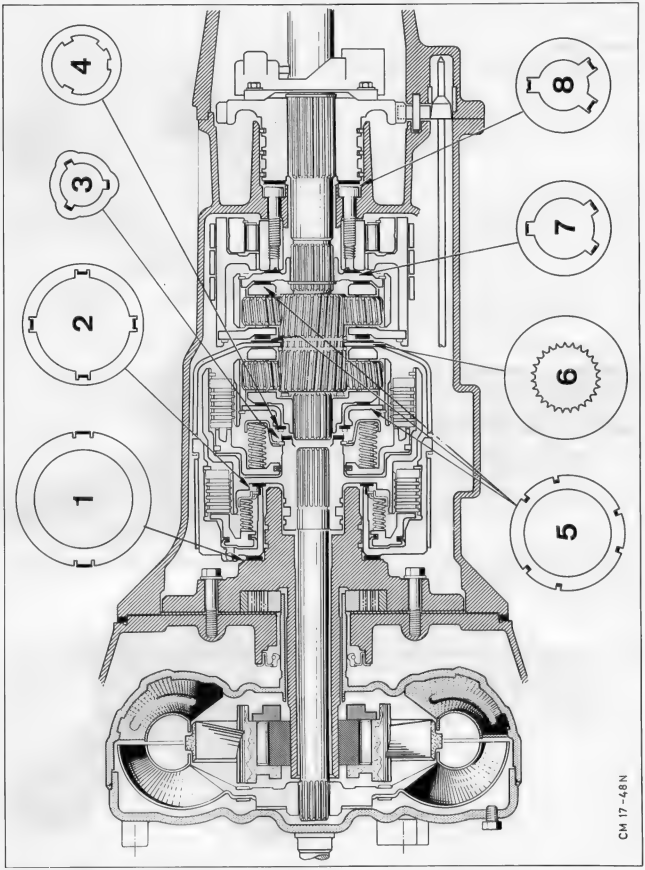


Fig. 109. Location and numbering of various thrust washers in transmission assembly
Thrust washer No. 1 is available in five different thicknesses; thrust washer No. 5 is available in three different thicknesses and fitted as follows:
(a) in front of the front planet carrier (b) in front of the rear planet carrier (c) behind the rear planet carrier

PART 'B'

36. Fit thrust washer No. 8, Fig. 110, in transmission housing.

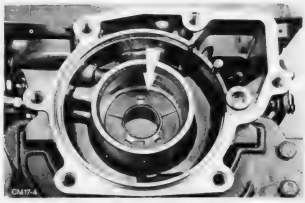


Fig. 110. Thrust washer No. 8

37. Install output shaft complete with governor, taking care not to damage piston rings on governor hub, Fig. 111.

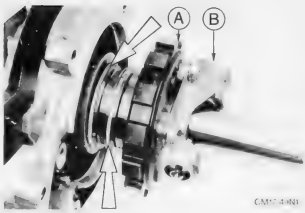


Fig. 111. Output shaft complete with governor
A – Governor hub
B – Governor body

38. Fit thrust washer No. 7 into housing, Fig. 112. Install annulus and secure with circlip.

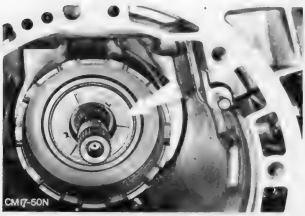


Fig. 112. Thrust washer No. 7 in transmission housing

PART 'B'

17 214 8 (cont'd)

39. Stick thrust washer No. 5 to back of planet carrier, Fig. 113. Fit planet carrier and secure with circlip. To do this pull rear brake drum forward a little so that circlip groove is free.

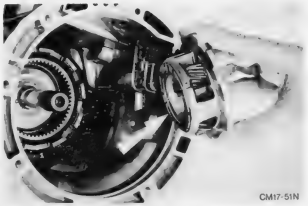


Fig. 113. Insert thrust washer No. 5 together with planet carrier into transmission housing

40. Locate rear brake band (with two recesses on abutment pins) in housing. Fig. 114

Then check correct location of brake band, using screwdriver through rear servo operating bore, Fig. 114.

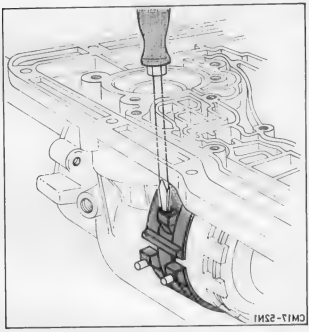


Fig. 114. Check brake band location, using screwdriver through rear servo operating bore

41. Immerse servo piston in oil and fit cover. Insert coil spring and piston complete with cover in housing and secure, Fig. 115.

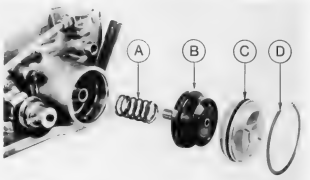


Fig. 115. Front servo
A – Spiral spring
B – Servo piston
C – Servo cover with O-ring
D – Circlip

PART 'B'

42. Stick thrust washer No. 5 on to planet carrier and ensure that intermediate lever of front brake band is in downward position. Fit completed front assembly while turning output shaft slightly, Fig. 116. When fitting front assembly take care that parts do not become separated.

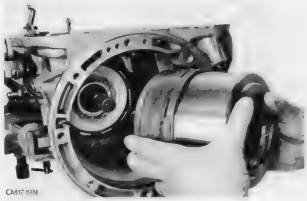


Fig. 116. Insert completed front assembly into transmission housing

43. Place front brake band in position and fit struts together with adjustment screw, starting with strut nearest servo piston, Fig. 117. Remove brass clip. Screw adjustment screw in far enough to make it impossible for struts to fall out.

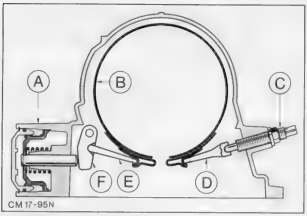


Fig. 117. Front brake band fitted
A – Front servo
B – Brake band
C – Brake band adjustment screw
D – Strut
E – Strut
F – Intermediate lever

44. Turn transmission round on stand until output shaft faces downwards. Carefully insert hydraulic pump body together with thrust washer No. 1 into front assembly, Fig. 118.

In process, do not damage piston rings and ensure that thrust washer No. 1 sticks to pump body.

Measure end-float as described in sub-operation 10.

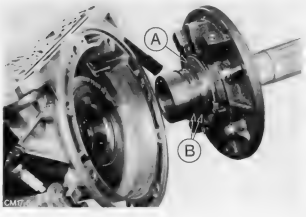


Fig. 118. A – Thrust washer No. 1
B – Piston rings

PART 'B'

17 214 8 (cont'd)

45. Remove hydraulic pump body again, while holding front gear train with a screwdriver. Fig. 119A.

    When installing, small gear wheel should be fitted with recess **upwards** and large gear wheel with spot mark **downwards,** Fig. 119B.

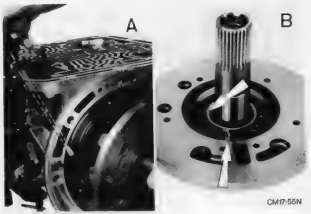


Fig. 119. A – Removing pump body
B – Relative positioning of pump gear wheels

46. Place steel plate on pump (pay attention to position of bores). Fig. 120. Slowly rotate pump and steel plate and place them together on converter casing.

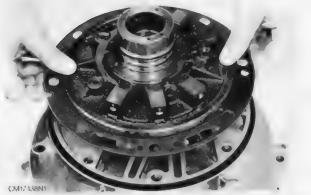


Fig. 120. Align bores in steel plate with hydraulic pump and converter casing

47. Fig. 121. Screw up the bolts fixing the hydraulic pump finger tight at first, and apply tool 17–009–01 far enough to cause the stub to engage in the hydraulic pump.

    Insert the output shaft into the pump and lightly tighten the bolts. Now rotate tool and impeller clockwise to check for free rotation.

48. Tighten bolts to specified torque and remove tool (see Technical Data).

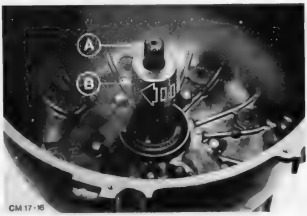


Fig. 121. Centring of converter housing/pump using Special Tool 17–009–01
A – Input shaft
B – Special Tool 17–009–01

PART 'B'

49. Stick thrust washer No. 1 to pump housing. Fit sealing ring on to converter housing and place a paper gasket on to transmission housing. Carefully mount converter housing complete with pump, without damaging pump piston rings, Fig. 122. Insert bolts, with new aluminium washers, and torque as specified (see Technical Data).

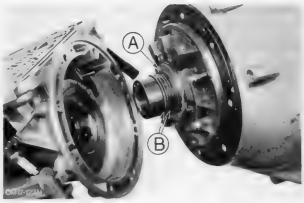


Fig. 122. Install converter casing
A – Thrust washer No. 1
B – Piston rings

50. Screw in brake band adjustment screw using Tool 17–005, Fig. 123, until torque wrench releases. **Then slacken adjustment screw by 1½ turns** and secure adjustment screw with a new lock nut.
51. Fit downshift cable bracket.

Fig. 123. Adjust front brake band using Tool 17–005

52. Fit return spring and parking pawl together with dowel in transmission extension housing, Fig. 124.

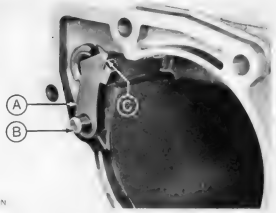


Fig. 124. Extension housing with parking pawl
A – Parking pawl
B – Dowel
C – Return spring

PART 'B'

17 214 8 (cont'd)

53. Fit extension housing using a new gasket paying attention to correct seating of parking pawl actuating rod, Fig. 125. Torque bolts as specified in Technical Data.

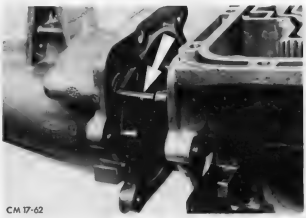


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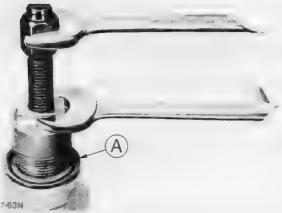
Fig. 125. Fit extension housing paying attention to correct seating of parking pawl actuating rod

54. Remove extension housing oil seal using Tool 17–001, Fig. 126.

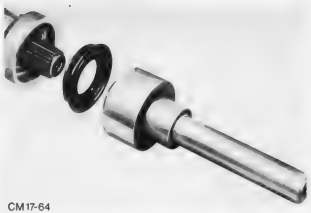
Driveshaft bearing bush in extension housing is not available as a separate part.



CM17-63N

Fig. 126. Remove extension housing oil seal, holding tool with an open ended spanner
A – Oil seal

55. Press in a new extension housing oil seal using Tool 17–002, Fig. 127.



CM17-64

Fig. 127. Press in a new extension housing oil seal using Tool 17–002

PART 'B'

Overhaul of Valve Body

When dismantling valve body take care not to interchange valve springs in spite of their colour markings. Carefully clean oil channels and all parts with paraffin, blow through with compressed air and inspect for burring, groove formation and deposits due to gum formation. If necessary, renew valve body.

56. Remove cover plate bolts (2), Fig. 128 and carefully lift off plate and gasket. Take out ball valves (5) and two pressure relief valves with springs. Remove retaining plates, dowels, plugs and valves with springs.

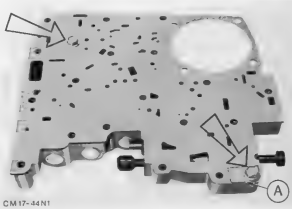


Fig. 128. Cover plate securing bolts
A – Identification plate

57. Oil all parts with automatic transmission oil and check that they move easily.

    Carefully refit valves, springs (note colour markings) and plugs as shown in Fig. 131 and then secure valves with retaining plates or pins.

58. Fit ball and relief valves and springs. Fig. 132. Install cover plate with new gasket, Fig. 129, fitting outer mounting bolts (11) for alignment of intermediate plate and valve body. Tighten two cover plate bolts to specified torque and remove remaining bolts.

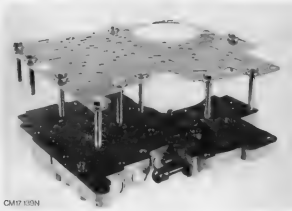


Fig. 129. Fit valve body

59. Place valve body on transmission housing with a new gasket, locating link rod into manual selector valve, Fig. 130A. Fit bolts (pay attention to different lengths) and torque as specified. Fit interlock spring (1 bolt). Downshift lever (kickdown) should be in position between stop and downshift valve, Fig. 130B.

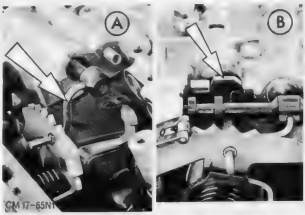


Fig. 130. A – Install valve body locating connecting rod into manual selection slide
B – Downshift lever (kickdown) should be in position between stop and downshift valve

PART 'B'

17 214 8 (cont'd)

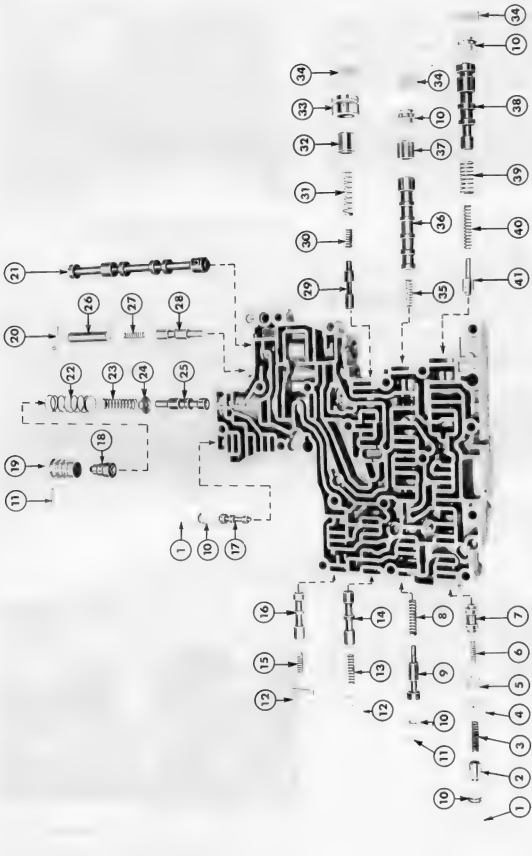
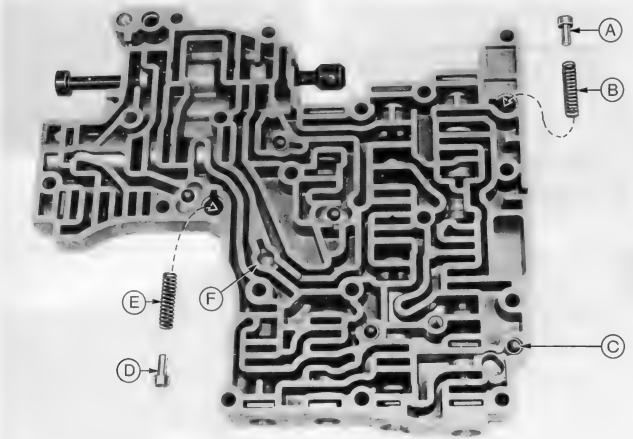


Fig. 131. Valve body dismantled

PART 'B'

Fig. 131. Valve body dismantled

1. Retaining plate
2. Band release delay valve
3. Valve spring (light green)
4. Retaining plate
5. Spacer
6. Valve spring (dark blue)
7. Servo regulator valve (2nd-3rd gear)
8. Valve spring (dark blue)
9. Throttle pressure boost valve
10. Plug
11. Retaining pin (fit in top groove)
12. Retaining plate
13. Valve spring (brown)
14. Shift control valve (3rd-2nd gear)
15. Valve spring (orange)
16. Modulator valve (3rd-2nd gear)
17. Line pressure reducer valve
18. Line pressure boost valve
19. Bush
20. Retaining pin
21. Manual selector slide
22. Valve spring (dark blue)
23. Valve spring (orange)
24. Spring retainer
25. Line regulator valve
26. Spacer
27. Valve spring (yellow)
28. Kickdown valve
29. Pressure boost valve (selector position 1st-2nd gear)
30. Valve spring (light green)
31. Valve spring (light blue)
32. Pressure boost valve (selector position 1-2)
33. Plug
34. Retaining plate
35. Valve spring (white)
36. 2nd gear valve
37. Shift valve (1st-2nd gear)
38. Shift valve (2nd-3rd gear)
39. Valve spring (dark blue)
40. Valve spring (orange)
41. Throttle pressure reducing valve



CM17-45N2

Fig. 132. A – converter relief valve
B – valve spring (white)
C – ball valve (5 off)
D – throttle relief valve
E – valve spring (white)
Earlier transmission assemblies have valve springs of different length (valve spring B short, valve spring E long)

PART 'B'

60. Insert rear servo piston with its spring into housing and fit cover with a new gasket.

    If transmission housing, servo piston or rear brake band has been renewed, length of piston push rod must be determined as follows:

    Install servo piston complete with any piston rod and spring. Fit Tool 17–012 (adjustment screw fully retracted) with a new gasket and tighten bolts to specified torque. (One of the three stop nipples must be exactly under measurement slot.) Measure distance between cover and piston with a depth gauge and note it, Fig. 133. Screw in adjustment screw with Tool 17–005 until torque wrench jumps a notch, Fig. 134. Measure new distance and note it.

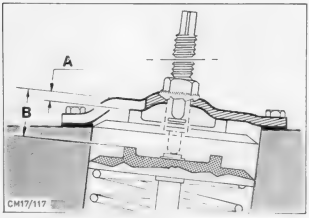


Fig. 133. Determine stroke of rear servo piston
A – 3,7 mm (0,147 in)
B – 8,3 mm (0,327 in)

Example:

Measurement 'B'	8,3 mm (0,327 in)
Measurement 'A'	3,7 mm (0,147 in)
Servo piston stroke	4,6 mm (0,180 in)

Piston stroke should be between 4,0 and 7,0 mm (0,16 to 0,27 in).
If it is above top limit a longer piston push rod must be selected, if it is below bottom limit a shorter one.

Piston push rods, which are held in servo piston by a circlip, are made in 3 different lengths. They have coloured spots to distinguish them:

yellow	84,25 mm (3,317 in)
green	86,75 mm (3,415 in)
red	89,25 mm (3,514 in)

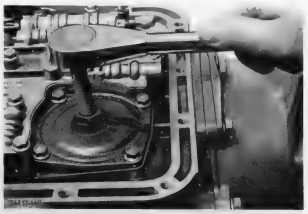


Fig. 134. Adjust adjustment screw with Tool 17–005

61. Fit oil filter using a new gasket and starter inhibitor switch using a new O-ring.

62. Fit oil pan using a new gasket (13 bolts) and torque bolts as specified.

63. Insert input shaft (with short splines facing direction of travel) and insert torque converter up to stop.

    When converter hub is fully engaged in driving gear of hydraulic pump, distance 'A' between flange of converter housing and front face of locating stub should be not less than 10 mm (0,14 in), Fig. 135.

    Remove transmission from stand and bracket from transmission.

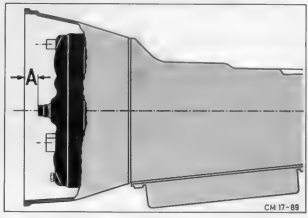


Fig. 135. Distance between converter housing flange and converter locating stub
A – Not less than 10 mm (0,4 in)

PART 'B'

17 238 VACUUM DIAPHRAGM – REMOVE AND INSTALL

Special Service Tools Required: None

To Remove

1. Undo clamp and disconnect vacuum hose at vacuum diaphragm.
2. Remove diaphragm bracket bolt and remove bracket, Fig. 136.
3. Take out diaphragm and actuating pin.

To Install

4. Check freedom of movement of throttle valve.
5. Oil a new O-ring and fit it on (diaphragm) connection. Fit actuating pin and diaphragm.
6. Fit diaphragm bracket. Connect vacuum hose and secure it with clamp.
7. Check oil level in accordance with instructions and top up with specified oil if necessary.

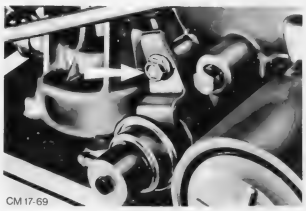


Fig. 136. Vacuum diaphragm attachment

17 252 SERVO ASSEMBLY – FRONT – REMOVE AND INSTALL

Special Service Tools Required: None

To Remove

1. To remove servo. Slacken brake band adjusting screw by four turns.

   With aid of a screw clamp, press servo piston in far enough to allow circlip to be removed, Fig. 137B. **In order not to damage the housing, a piece of wood should be inserted, Fig. 137A.** Take out servo piston and spring. Watch out for oil leakage.

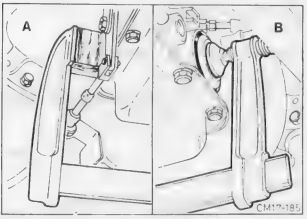


Fig. 137. Removal of front servo using a screw clamp
A – Protect housing with wooden block
B – Remove servo piston spring

2. If spring force will not push out servo cover, force parts out carefully with compressed air as shown, after oil pan has been removed (watch out for oil). Cover outlet hole in process, Fig. 138.

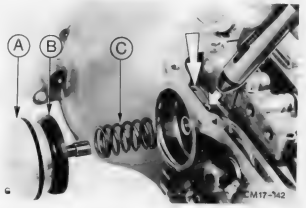


Fig. 138. Front servo removed
A – Servo cover with oil seal
B – Servo piston
C – Spiral spring

PART 'B'

To Install

3. Renew servo cover oil seal if necessary and insert coil spring into housing. Install piston and cover, pushing cover in far enough to allow circlip to be properly fitted.
4. Fit oil pan using a new gasket and tighten bolts to specified torque in two stages, Fig. 139.
5. Adjust brake band as described in Operation 17 132.
6. Fill up with specified oil and check oil level in accordance with instructions.

Fig. 139. Fit oil pan with a new gasket

17 256 SERVO ASSEMBLY – REAR – REMOVE AND INSTALL

Special Service Tools Required: None

To Remove

1. Remove oil pan (13 bolts). Watch out for escaping oil.
2. Unbolt oil filter and remove gasket.
3. Unbolt rear servo cover and remove gasket. Take out servo piston and spring, and, if necessary, renew O-rings, Fig. 140.

Cover is raised by force of spring.

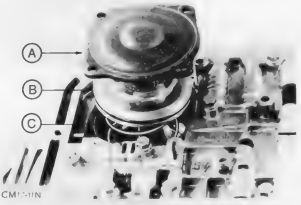


Fig. 140. Rear servo
A – Servo cover
B – Servo piston
C – Spiral spring

To Install

4. Place servo piston and spring in housing and fit cover using a new gasket. Fit oil filter using a new gasket, Fig. 141.

The piston push rod, which is retained in servo piston by a circlip, is available in three lengths (colour coded, see Parts Catalogue).

5. Fit oil pan using a new gasket and tighten bolts to specified torque in two stages.
6. Fill up with specified oil and check oil level in accordance with instructions.

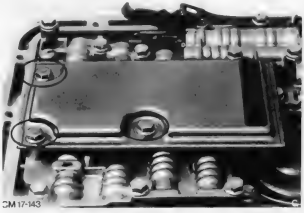


Fig. 141. Fit oil filter

PART 'B'

17 354 GOVERNOR – REMOVE AND INSTALL

Special Service Tools Required: None

To Remove

1. Remove driveshaft (6 bolts).
2. Detach transmission support bracket from floor assembly and transmission extension assembly (5 bolts), Fig. 142. Lower transmission carefully.
3. Detach speedometer drive (1 bolt) and unbolt extension housing (6 bolts).

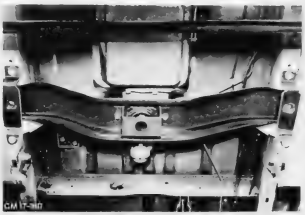


Fig. 142. Transmission support bracket

4. Remove circlip from governor connecting pin and withdraw governor valve. Detach governor from governor hub (4 bolts), Fig. 143.

To Install

5. Slide governor on to output shaft, align and bolt on to governor hub.

   Governor will only fit in one position. Turn it through 180° if necessary.

6. Fit governor connecting pin and valve and secure with a **new** circlip, Fig. 143.

   Circlip must be up against outer collar of pin.

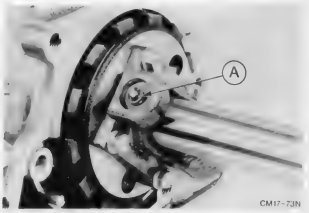


Fig. 143. Governor installed
A – Connecting pin circlip

7. Fit transmission extension housing using a new gasket, paying attention to correct seating of parking pawl actuating rod, Fig. 144. Torque bolts as specified.
8. Raise transmission and secure support bracket to floor assembly and extension housing. Torque bolts as specified.
9. Fit speedometer drive and install driveshaft.
10. Check oil level in accordance with instructions and top up if necessary.

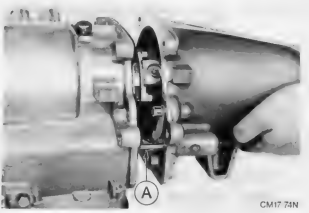


Fig. 144. Fit extension housing
A – Parking pawl actuating rod

PART 'B'

17 376 SEAL – EXTENSION HOUSING – REPLACE

Special Service Tools Required:

Transmission extension housing oil seal remover 17–001
Transmission extension housing oil seal replacer 17–002

To Remove

1. Drive vehicle over a pit or on to a ramp and remove driveshaft assembly.
2. Remove oil seal using Tool 17–001, Fig. 145.

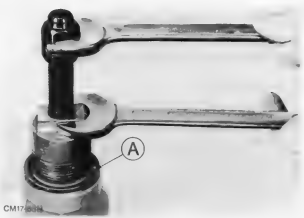


Fig. 145. Remove transmission extension oil seal holding Special Tool with a spanner
A – Oil seal

To Install

3. Press in a new oil seal using Tool 17–002, Fig. 146.
4. Install driveshaft assembly.
5. Check transmission oil level in accordance with instructions and top up if necessary.

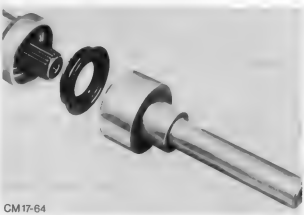


Fig. 146. Press oil seal into transmission extension housing using Tool 17–002

17 382 GEAR – SPEEDOMETER DRIVEN – REMOVE AND INSTALL

Special Service Tools Required: None

To Remove

1. Remove input shaft bracket on transmission (1 bolt) and withdraw cable with gear.
2. Remove clip and withdraw gear from cable.

To Install

3. Slide gear into position and fit clip.

   When renewing gear pay attention to number of teeth.

4. Fit cable and gear in transmission housing and fit bracket, Fig. 147.

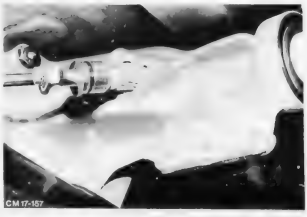


Fig. 147. Remove speedometer gear with shaft

PART 'B'

17 694 INHIBITOR SWITCH – REMOVE AND INSTALL

Special Service Tools Required: None

1. Disconnect cable plug connector from switch.
2. Unscrew starter inhibitor switch and remove O-ring, Fig. 148.

To Install

3. Screw starter inhibitor switch into transmission housing using a new O-ring. Pay attention to tightening torque.
4. Fit cable plug connector.
5. Check that engine starts only when selector lever is in 'P' or 'N' position and that reversing light comes on only in 'R' position (when ignition is turned on). Neither of these things must happen in any other position.

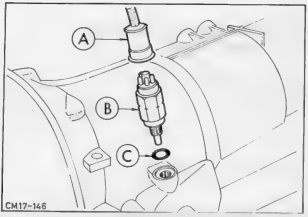


Fig. 148. Starter inhibitor switch
A – Connector
B – Inhibitor
C – 'O'-ring

TECHNICAL DATA

Make	Ford
Type	C3
Transmission fluid (Ford Specification)	SQM-2C-9007-AA (M2C-33G)
Total oil capacity (approx.)	Transmission with converter and oil cooler – 6,5 litres (11,4 pints)
Selector lever positions	P-R-N-D-2-1
Torque converter	Trilock (hydraulic)
Converter ratio	2,35 : 1
Transmission ratios	1st gear – 2,47 : 1 2nd gear – 1,47 : 1 3rd gear – 1 : 1 Reverse gear 2,11 : 1
Oil cooler	Twin-tube type

Transmission oil pressures	MN/m²	kgf/cm²	lbf/in²
1. With engine idling (no pressure on accelerator pedal) :			
Selector position – R	0,6 to 0,9	6,0 to 9,0	85 to 128
– P-N	0,34 to 0,50	3,4 to 5,0	48 to 71
– D-2-1	0,4 to 0,6	4,0 to 6,0	57 to 85
2. At stall speed (accelerator pedal fully depressed) :			
Selector position – R	1,67 to 1,90	16,7 to 19,0	237 to 270
– D-2-1	1,00 to 1,14	10,0 to 11,4	142 to 162

Tightening torques		Nm	kgf m	lbf ft
Torque converter housing to transmission housing	M10 × 30	36 to 52,3	3,6 to 5,3	26 to 38
Transmission extension to transmission housing	M10 × 30	36 to 52,3	3,6 to 5,3	26 to 38
Hydraulic pump to converter housing	M6 × 35	9 to 13	0,9 to 1,3	7 to 9
Drive disc to converter	M10 × 14	36 to 41	3,6 to 4,1	26 to 30
Control block to transmission housing	M6 × 35 M6 × 40 M6 × 45 M6 × 30	9 to 12,1	0,9 to 1,2	7 to 9
Intermediate plate to control block	M6 × 25	9 to 12,1	0,9 to 1,2	7 to 9
Cover to servo housing	M6 × 20	9 to 13	0,9 to 1,3	7 to 9
One-way clutch to housing	M6 × 25	9 to 13	0,9 to 1,3	7 to 9
Oil pan to transmission housing	M8 × 14	16 to 23,5	1,6 to 2,4	12 to 17
Governor to governor hub	M6 × 16	9 to 13	0,9 to 1,3	7 to 9
Downshift cable bracket	M8 × 14	16 to 23,5	1,6 to 2,4	12 to 17
Nut, downshift lever (outer)	M8 × 1	10 to 15	1,0 to 1,5	7 to 11
Nut, downshift lever (inner)	M14 × 1,5	41 to 54	4,1 to 5,4	30 to 39
Starter inhibitor switch	M12	16 to 20	1,6 to 2,0	12 to 14
Brake band adjusting screw lock nut	½ in. – 16	47 to 61	4,7 to 6,1	34 to 44
Vacuum diaphragm bracket	M6 × 20	1,7 to 2,6	0,17 to 0,3	14 – 26 lbf/in.
Oil line to connector	⅜ in. – 24 (⅛ in. – 20)	9 to 14	0,9 to 1,4	7 to 10
Oil cooler line to connector	½ in. – 20	16 to 20	1,6 to 2,0	12 to 14
Oil line connector to transmission housing	⅛ in. – 27	14 to 20	1,4 to 2,0	10 to 14
Converter housing to engine	M10	30 to 37	3,0 to 3,7	22 to 27
Converter drain plug	⅛ in. – 27	27 to 40	2,7 to 4,0	20 to 29

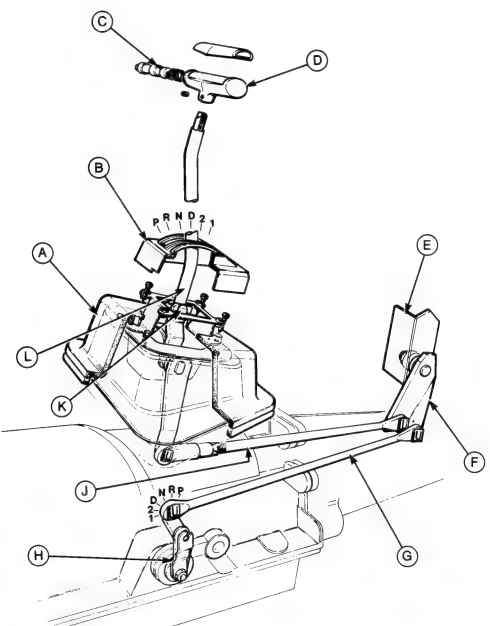
AUTOMATIC TRANSMISSION 17B

Index	Page
General Description	2
Special Service Tool Recognition	3
Service and Repair Operations Content	3
Service and Repair Operations	4
Technical Data	10

GENERAL DESCRIPTION

The floor mounted gear selector housing and lever bracket is retained at its floor location with four bolt and washer assemblies. Covering this is a sound insulation gaiter retained with three crosshead screws. The gaiter has two thicknesses at the base 'A' Fig. 1, availability depending on the thickness of carpet fitted.

The selector mechanism comprises a lever and handle with built in push type release button. When the button is pressed a cable inside the lever lifts a pawl stub out of the selected notch in a guide plate. The guide plate is attached to the bracket, at the base of the lever, Fig. 10.



TR17/200IN

Fig. 1. Gear selector (RHD shown)

A – Sound insulation gaiter
B – Control indicator
C – Push button assembly
D – Control handle
E – Relay lever bracket
F – Control rod relay
G – Lower rod assembly
H – Transmission control lever
J – Upper rod assembly
K – Lamp shroud location
L – Lever

GENERAL DESCRIPTION (cont'd)

Two rods situated below the floor pan transmit movement of the selector lever to the transmission box.

The upper rod is connected between the selector arm and the control rod relay lever. Adjustment to the upper rod can be made at the selector arm end. The lower rod, which is of fixed length, is attached to the control rod relay lever, then runs to the transmission control lever.

SPECIAL SERVICE TOOL RECOGNITION

Tool	Tool Name
G/7/079/D	No special service tools required

SERVICE AND REPAIR OPERATION – CONTENT

AUTOMATIC TRANSMISSION	Described in this publication	Contained in operation	Also applicable to certain variants in the following model range.					
			Transit '77	Fiesta	Escort '75 onwards	Capri II	Taunus 76/ Cortina 77	Granada '78
17 634 Gear selector mechanism – remove and install	X	—	—	X	X	X	X	X
17 634 8 Gear selector mechanism – overhaul (selector mechanism removed)	X	—	—	X	X	X	X	X
17 666 Cable – selector – adjust	X	—	—	X	X	X	X	X
17 667 Cable – selector – remove and install	—	17 634 8	—	X	X	X	X	X
17 673 Rods – selector – remove and install	X	—	—	—	—	—	—	—
17 682 Cable – downshift – adjust	—	17 683	—	X	X	X	X	X
17 683 Cable – downshift – remove and install	X	—	—	X	X	X	X	X

SERVICE AND REPAIR OPERATIONS

17 634 GEAR – SELECTOR MECHANISM – REMOVE AND INSTALL

Special Service Tools Required: None

To Remove

1. Lift off selector indicating housing from selector lever bracket, 'A' in Fig. 3.
2. Remove three screws lift off sound insulation gaiter from selector lever bracket, 'B' in Fig. 3.
3. Remove lamp shroud by sliding upwards from its location on selector lever, pull out bulb assembly, Fig. 4.

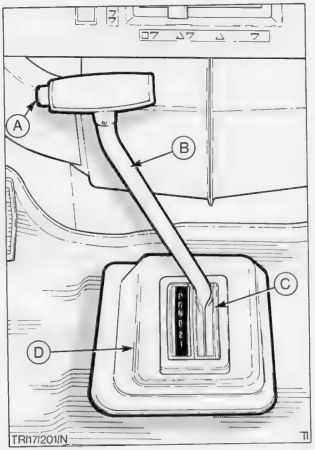


Fig. 2. Gear selector (LHD shown)
A – Push button
B – Lever
C – Indicator
D – Sound insulation gaiter

4. Remove four bolts and washers, detach selector lever bracket and gasket from floor pan location, Fig. 4.
5. Raise selector mechanism to gain access to retaining clip of gearshift lever end.

   NOTE: The end of the gearshift lever is attached to the upper selector rod. When the clip is removed and the selector mechanism unhooked, the upper rod will drop out of reach below the vehicle. Therefore it will necessitate wiring the rod in position for easy refitment.

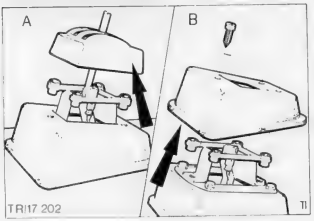


Fig. 3. Removing selector indicator housing, and sound insulation gaiter
A – Selector indicator housing
B – Sound insulation gaiter

6. Remove retaining clip, Fig. 5.
7. Unhook and take out selector lever assembly.

To Install

8. Reposition selector lever mechanism lower end to upper rod, remove holding wire, secure retaining clip. Adjust if necessary, refer to Operation No. 17 673.
9. Fit selector lever bracket and gasket to floor pan location. Secure four bolts to 8,5 to 10,0 Nm (0,8 to 1,0 kgf.m) (6 to 8 lbf.ft).
10. Resecure lamp shroud and bulb assembly to selector lever.
11. Position sound insulation gaiter to selector lever bracket. Secure with three screws.
12. Press selector indicating housing back onto selector lever bracket.

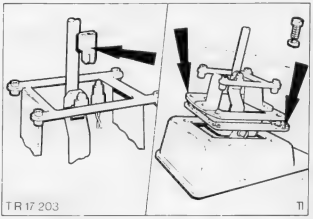


Fig. 4. Remove lamp shroud and selector lever bracket

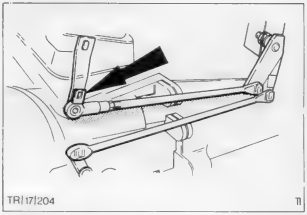


Fig. 5. Remove clip from gearshift lower end

17 634 8 GEAR – SELECTOR MECHANISM – OVERHAUL (Selector mechanism removed)

Special Service Tools Required: None

To Remove

1. Remove rubber grommet from lower end of selector lever housing, Fig. 6. Unscrew nut, press lever arm out of housing. Remove bushes from housing.
2. Unscrew locknut on operating cable, withdraw selector pawl and, spring from the bottom end of selector lever, Fig. 7.
3. Remove socket head cap screw from selector lever handle, remove handle. Disengage cable nipple from roller assembly at top of selector lever.

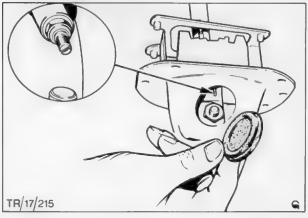


Fig. 6. Remove grommet from selector lever housing (insert shows locknut on operating cable)

17 634 8 (cont'd)

4. Remove push button assembly, Fig. 8.
5. Drive out pin, Fig. 9. remove operating cable combined guide bush and top linkage through bottom end of lever arm.

To Install

6. Install operating/cable back up through bottom of lever arm. Refit cable nipple over roller assembly. Resecure top linkage with pin.

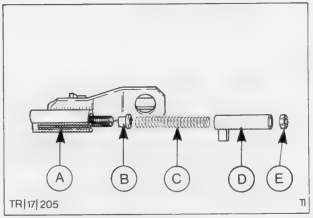


Fig. 7. Lower selector lever assembly
A – Lever
B – Bush
C – Spring
D – Selector pawl
E – Locknut

7. Refit push button to handle, longest key way first. See insert Fig. 8.
8. Holding push button against the spring, locate handle to selector lever and secure with socket head cap screw.
9. Apply smear of grease to selector pawl, refit with spring and guide bush back into selector lever lower end. Screw on locknut.

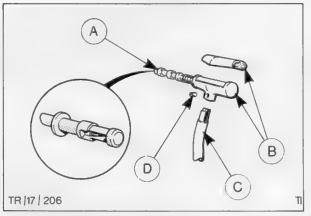


Fig. 8. Selector lever handle assembly
A – Push button
B – Handle
C – Lever top
D – Socket head cap screw

10. Position bushes in selector lever housing fill slots with grease meeting Ford Specification EM-1C-18, install lever arm. Tighten nut.
11. Adjust cable as described in Op. 17 666. Refit rubber grommet into selector lever housing.

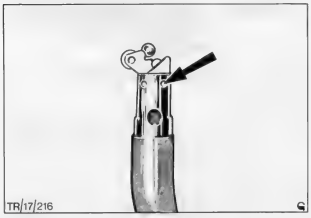


Fig. 9. Selector lever operating cable top linkage

17 666 CABLE – SELECTOR – ADJUST

Special Service Tools Required: None

To Adjust

1. Engage selector lever in 'D' position, remove selector indicator housing.

   NOTE: To make necessary adjustments to the operating cable, the rubber grommet has to be removed from the selector lever housing, see Fig. 6.

2. Using a feeler gauge, adjust operating cable by means of locknut to give 0,1 to 0,2 mm (0,004 to 0,008 in) clearance between selector pawl stub and notch, Fig. 10, on selector lever housing.

3. Refit grommet back into selector lever housing.

4. Refit selector indicator housing.

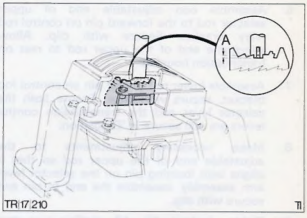


Fig. 10. Selector pawl stub and notch clearance
A – 0,1 to 0,2 mm (0,004 to 0,008 in) in 'D' position

17 673 RODS – SELECTOR – REMOVE AND INSTALL

Special Service Tools Required: None

To Remove

1. Remove clips from each end of upper gear shift rod 'A' in Fig. 11. Unhook rod.

2. Remove clips from each end of lower gear shift rod 'B' in Fig. 11. Unhook rod.

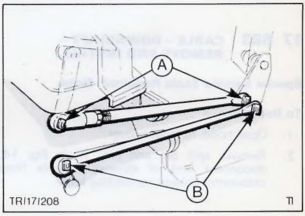


Fig. 11. Selector rod retaining clips
A – Upper gear shift rod clips
B – Lower gear shift rod clips

3. If necessary renew selector rod and selector lever bushes. Fig. 12.

To Install

NOTE: The vehicle must be standing on road wheels when adjusting selector lever.

4. Engage selector lever in 'D' position.

5. Locate transmission control lever, 'H' in Fig. 1. in 'D' position two notches from extreme forward position and secure.

   NOTE: This is achieved by pushing the transmission control lever fully forward and then moving it backwards by two notches. Ensure the transmission control lever remains in this position whilst adjustment of the selector rods is carried out.

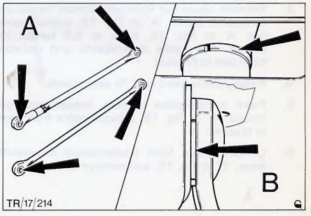


Fig. 12. Bush locations
A – Selector rod bushes
B – Selector lever bushes

17 673 (cont'd)

6. Assemble non adjustable end of upper selector rod to the forward pin on control rod relay bracket. Secure with clip. Allow adjustable end of the upper rod to rest on transmission housing.
7. Assemble lower rod to rear pin on control rod bracket, secure with clips. Ensure both the selector lever and the transmission control levers are still secure in 'D' position.
8. Make necessary adjustments to the adjustable end of the upper rod so that it aligns with locating pin on the selector lever arm assembly, assemble the end to pin and secure with clip.
9. Tighten locknut, Fig. 13, making sure that adjustable end of gear shift rod remains vertical.
10. Check that selector lever can be engaged in every selector position and that engagement can be felt.

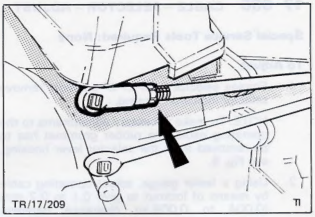


Fig. 13. Adjustable end on upper control rod

17 683 CABLE – DOWNSHIFT – REMOVE AND INSTALL

Special Service Tools Required: None

To Remove

1. Open hood, fit fender cover.
2. Remove split pin and pin, 'A' in Fig. 14, disconnect end of downshift cable from carburettor linkage connecting lever.

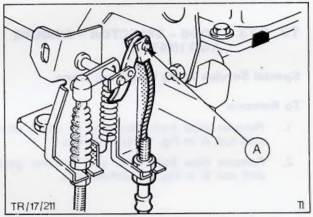


Fig. 14. Downshift cable connection at carburettor
A – Split pin and pin

3. Remove upper nut from adjustment thread on downshift cable, 'A' in Fig. 15, screw lower nut 'A' in Fig. 15, back to full length of thread. Pull cable downwards and unhook from slot in bracket.
4. Raise vehicle front end, fit axle stands.
5. From transmission bracket, loosen nuts on thread, 'B' in Fig. 15, unhook cable from slot in bracket.
6. Unhook cable from transmission downshift lever, 'C' in Fig. 15, and remove cable.

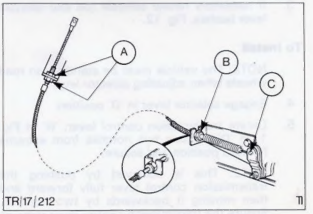


Fig. 15. Downshift cable assembly
A – Upper cable adjustment nuts
B – Lower cable retaining nuts
C – Transmission downshift lever

To Install

7. Hook cable back into transmission downshift lever.
8. Position cable back into slot in bracket at transmission end. Secure the nuts.
9. Remove axle stands, lower vehicle to ground.
10. Position cable back into slot in bracket carburettor end.
11. Connect cable end to carburettor linkage connecting lever, Replace split pin.
12. Adjust downshift cable as follows: Press downshift cable connecting lever, 'B' Fig. 16, away from operating shaft lever, 'A' Fig. 16, by using a suitable screwdriver. Lengthen or shorten cable by means of the adjustment nut on the upper thread of the cable until a clearance of 0,2 to 1,0 mm (0,008 to 0,04 in) is obtained between operating shaft lever, 'A' Fig. 16, and downshift cable connecting lever, 'B' Fig. 16. Secure the nuts.
13. Remove fender cover, close hood.

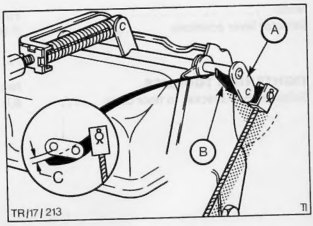


Fig. 16. Adjustment setting
A – Operating shaft lever
B – Cable connecting lever
C – Clearance 0,2 to 1,0 mm (0,008 to 0,04 in)

TECHNICAL DATA

Make	Ford
Selector lever positions	P-R-N-D-2-1

TIGHTENING TORQUES	Nm	kgf. m	lbf. ft
Selector lever bracket to floor bolts	8,5 to 1,0	0,8 to 1,0	6 to 8